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Operational Requirements Document (ORD) for Warfighters' Simulation (WARSIM) 2000

28 August 96 (Version 2)

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Annex B (Coordination) to ORD for WARSIM 2000

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1. General Description of Operational Capability. WARSIM 2000 will increase the effectiveness of commander and battle staff training by dramatically increasing the realism and the scope of the available training environment. In conjunction with other services' simulations, WARSIM 2000 will provide a complete operational environment with scenarios drawn from the entire operational continuum to support Army, joint and coalition force training distributed across the globe.

a. The WARSIM 2000 simulation system will use a computer-based simulation and associated hardware to support the training of unit commanders and their battle staffs from battalion through theater-level as well as to support training events in educational institutions. Designed and built using modern computer technology, modern software engineering techniques, and validated algorithms and databases, it will allow units world-wide to train using their organizational equipment. A key feature of the system will be its use of technology to minimize the total Army's overhead associated with supporting training. The system will be designed to be compliant with the emerging High Level Architecture (HLA) for Advanced Distributed Simulation (ADS) to facilitate interoperability with other HLA compliant simulations, simulators, and live training events.

b. The WARSIM 2000 simulation system will consist of, or use, several components:

(1) Computer-based battle simulation models that portray the joint and combined environment needed to support Army training events.

(2) Software modules for linking WARSIM 2000 to other simulation models to expand the training environment for joint force training exercises.

(3) Databases.

(4) Computer systems to run the simulation models and support the databases.

(5) Technical control systems/workstations for use by personnel in an exercise support function, e.g., simulation controllers, analysts, and opposing/ surrounding forces role players.

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(6) Flexible and responsive terrestrial/satellite communications gateways and media for transmitting voice, data, facsimile, and video between different elements at remote locations involved in supporting a training exercise.

c. WARSIM 2000 will meet the Mission Need Statement's (MNS's) requirement for providing a training environment that will allow unit commanders and battle staffs to focus their warfighters and systems in countering threats across the operational continuum. WARSIM 2000 must provide an environment that presents problems to stress and stimulate commanders and their battle staff to assess the situation, determine courses of action, and plan and issue new orders in a timely manner, all while using their organizational equipment and procedures.

d. Logistical support for WARSIM 2000 will be based on a government- owned contractor-supported system. The government will own necessary hardware, have all proprietary rights to the developmental hardware and software components, and full license rights to the non-developmental software components of WARSIM 2000. Contracted logistical support will provide for the maintenance of government-owned computer hardware at all times.

e. The acquisition and development strategy for WARSIM 2000 must abide by several constraints.

(1) The WARSIM 2000 acquisition must build upon the successful infrastructure of current simulations so that the training community (Army and international) can train in an evolutionary progressive yet consistent manner. The Army has invested significant resources into developing its training simulation systems, linking them with other service simulations via the Aggregate Level Simulation Protocol confederation, and proliferating them throughout the Army and the international community. While these systems have shortcomings that must be fixed, they provide a training environment and representations of combat that have been accepted by the training community world-wide. The WARSIM 2000 acquisition must allow the confederation of simulations structure to evolve in a manner that allows current users (Army and international) to maintain access to the confederation without having to make a substantial near-term investment in resources.

(2) Meeting the WARSIM 2000 requirements will demand significant technological innovations. However, there are many existing and developing systems that could and should be part of the overall solution. The acquisition strategy must ensure that developers optimize the investment of each service in existing systems (instead of starting from a blank sheet of paper) and insert technology into the training environment in a way that improves training.

(3) Fielding of new capabilities, whether they be functional representations or technological enhancements, must be either practically transparent to the user or be accompanied by training so the user can understand and receive the benefit of the new capabilities.

(4) Fielding plans for new capabilities must be synchronized so that perturbation of training units is minimized.

(5) The acquisition strategy must allow for regular user involvement in the development process. User evaluations and requirements must serve as a primary source for determining changes to the system.

f. WARSIM 2000 will be the primary contribution from the Army to the Joint Simulation System (JSIMS). WARSIM 2000 will provide simulation of the land warfare mission space for the JSIMS.

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2. Threat. Rather than counter a specific threat, WARSIM will provide a training environment capable of representing threats from across the operational continuum.

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3. Shortcomings of Existing Systems. Current simulations were designed for training corps and division

staffs on command and control techniques for Army operations in mid-intensity combat. Current software is bound to proprietary operating systems and hardware. The software design, especially the underlying representation of terrain, precludes representing the detailed functionality required for resolving the high resolution interactions needed to train commanders and battle staffs at levels from battalion to operational level commanders in joint scenarios for war and operations other than war.
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4. Capabilities Required. WARSIM 2000 will support commander and battle staff training from battalion up to theater level. While the major simulation models of WARSIM 2000 will run on computers housed in fixed regional facilities, transportable Simulation Support Modules (SSMs) will provide support functions under the control of a senior controller at locations near the training unit. Users of the simulation will train under the guidance of a senior trainer, usually the unit's commander, the next higher level commander, or an instructor at institutions. WARSIM will provide users a complete training environment consisting of simulations, data, support functions and communications.

a. System Performance. The following description of requirements for the WARSIM 2000 training environment addresses in turn each of the functional components described in paragraph 1.b.

(1) The Simulation. WARSIM 2000's simulation component must have the following functional characteristics.

(a) General Attributes.

(i) Size. The model must be large enough to support a multi-echelon corps or theater exercise. The model must also be able to link to other copies of itself to support larger exercises. The simulation must also be able to support multiple, concurrent, smaller training exercises, such as several battalion headquarters training independently.

(ii) Weather. The simulation must accurately portray the impact that weather elements have on operations (space, air, and ground). At a minimum, the simulation must account for the following weather elements: cloud amount and height, visibility, restrictions to visibility (e.g., precipitation, fog, smoke, dust and sand), precipitation accumulation, surface wind direction and speed, temperature, relative humidity, altimeter setting, and solar and lunar light data. These weather elements must be allowed to range from tropical to arctic regions, to vary over the geographic area of interest, and to change as often as hourly. In addition, wind direction and speed and temperature in a vertical profile up to 70,000 feet must be allowed to impact Nuclear, Biological and Chemical (NBC) weapons with changes incorporated at least twice per day.

(iii) Terrain. The simulation must provide a level of resolution of terrain such that tactical considerations of terrain analysis and the dynamic effects of man-made or natural occurrences (e.g., bomb craters, minefields, battle damage on roads, the obstacle effect of rivers, hydrography, and weather) as considered during Intelligence Preparation of the Battlefield (IPB) will affect the battle. The minimum acceptable tactical considerations include the following areas: the impact of line-of-sight (to include sonar and electromagnetic spectrum considerations of concealment, thermal, optical and radar visibility, and signal site emplacement) between potential interactors whether they be sensors or weapon systems, air, ship, or ground mounted; the ability of terrain to support the movement of personnel, vehicles and units over time, and the accurate portrayal of the location of natural and man-made obstacles. The outcomes of the simulated events must be sensitive to changes in the weather (described above in paragraph 4.a.(1)(a)(ii)) as it affects terrain.

(iv) Time. The simulation must be capable of running faster than real time to a pre-defined point in time or an event, while requiring minimal input, and providing summarized output. Users must be able to "age" the simulation to accommodate a

training scenario that describes actions in the midst of a campaign. The senior controller must be able to have the simulation start, stop/interrupt, rollback to any specified point in scenario, restart from a given point or the initial conditions and conduct concurrent replay. The senior controller must have the capability to change any attributes of the simulated entities or the game characteristics at any time.

(b) Conditions and Constraints.

(i) Scenarios. The goal is for the simulation to portray events that could arise from scenarios based on any point in the operational continuum. At a minimum, requirements are for scenarios for war in Europe, Southwest Asia, Southeast Asia and Korea and for operations other than war in these locations as well as Central and South America and Africa.

(ii) Fidelity. The simulation must allow commanders and battle staffs to do their tasks under the conditions and standards outlined in the Army Training and Evaluation Program Mission Training Plans (MTPs) for command groups and staff referenced in Appendix 1 to Annex A. The level of fidelity must be tailorable to the training audience and the tasks to be trained.

(iii) Level of Detail. The simulation must be able to portray a level of detail that captures the effects of individual entities on the battle, e.g., single weapon platform, emitter, and sensor systems. Entities that operate near each other as cohesive units can be portrayed in aggregated units from team to battalion that represent the normal mode of employment. Individual, low- density, entities that operate in a geographically dispersed mode must be portrayed as they are employed, e.g., signal nodes, radars, jammers, missile and rocket systems, engineer obstacle systems, and individual surveillance and laser designation systems. CSS data elements must be portrayed at the NSN, DODIC, LIN, TCN, name, SSN, rank, MOS, skill level, vehicle identification, and DODAAC level of detail to emulate doctrinally correct STAMIS reports for use by the training audience. The number of items played will be limited in any exercise by a Played Items List. All systems will be portrayed using performance data appropriate to the level of classification of the exercise.

(iv) Reports. The simulation must provide feedback to the training unit by sending reports of simulated events. These reports must be formatted in a doctrinally correct fashion in proper Standard Army Management Information System (STAMIS), or Army Battle Command System (ABCS), e.g., Combat Service Support, and/or Maneuver Control System formats, if applicable, and occur in a time-appropriate manner. The reports must not reveal all of ground truth but reflect that information that the simulated unit would reasonably know given its status, time removed from the reported incident, and deployed intelligence assets. The reports must be able to be modified to meet changing report forms as management information systems (MIS) evolve and change.

(v) Human Factors. The simulation must portray the effects of operations on the human condition as it relates to combat effectiveness and the individual/unit ability to perform TOE missions. At a minimum, the simulation must consider unit morale and cohesion, time subject to hostile actions, availability of religious support, unit attrition rate over time, weather, and operational tempo.

(vi) Simulated Mistakes. The simulation must cause simulated entities to "make mistakes" based on a predetermined level of training and a variable combat effectiveness determined by human factors (see 4.a.(1)(b)(v)). The mistakes should be of two types: mistakes in actions taken and mistakes in actions reported. Mistakes in actions taken fall along the lines of getting lost, e.g., arriving at or attacking the

wrong location, delivering the improper quantities of supplies, or delivering the wrong supplies. These types of mistakes will change the ground truth of the simulation. Along with reports that are accurate but incomplete, other reports will contain information that is different from ground truth. These mistakes in reporting will occur when a simulated unit makes a report to the training unit that conflicts with ground truth in the simulation. These mistaken reports will not change ground truth. The simulation must have the ability to provide the correct information if challenged for confirmation. The level of training and combat effectiveness must change over exercise time with a corresponding change in the number of mistakes. The senior trainer must have the capability to cause a simulated unit to make specific mistakes during the exercise. The senior trainer must be able to easily adjust the severity and frequency of simulated mistakes during an exercise to include being able to set the level to zero, in effect turning off the mistakes. The senior trainer and the After Action Review systems must have access to both ground truth and mistakes data.

(vii) Surrounding Units. Training units, to include combat, combat support, and combat service support units that support maneuver brigades, must be able to interact with the simulation without the presence of any other units. This will require the simulation to emulate forward, flank and rear units, supported and supporting units, as well as the next higher and lower echelon units, that would normally exist on the battlefield, but are not present for the particular training event. The simulation must be able to portray dynamic scenario and event dependent intelligence and reports concerning the activities of these units as well as their requests for information and resources from the training units.

(viii) Multi-Level Input/Output. The simulation must be able to accommodate an exercise where different levels (echelons above corps, division, brigade, battalion, TAACOM, COSCOM, DISCOM) are interacting with the simulation. Each level must be able to train using the simulation by issuing only its normal orders and instructions to the simulation while receiving only its normal reports and data from all sources. The simulation must receive and present its information in the format and level of detail appropriate to the training unit.

(c) Battlefield Operating Systems

(i) Intelligence. The WARSIM 2000 system must have the capability to portray a wide variety of threat systems, doctrine, organizations, and activities at the classification level appropriate to the training event. These threats must span the operational continuum while ranging from the most modern (or hypothesized) weapons of industrialized nations to the terrorist activities and operations other than war. The system must be able to provide the data output that is appropriate to the system being simulated. In the case of intelligence sensors, the system must be able to provide the raw data that would normally go from a sensor station to the unit headquarters for aggregation and analysis. Examples of this type of data include, targeting location data, live video imagery, moving target indicators, radar mappings, communications intercept data, etc. In the event the intelligence headquarters is not present in the training event, the system must provide data suitable for an All Source Analysis System as it would arrive from ground, air, and echelons above corps assets.

(ii) Maneuver. The simulation must portray the various capabilities of maneuver forces (heavy, light and aviation) on the battlefield. The simulation must be sensitive to different aspects of maneuver on the battlefield. Flank attacks must be resolved differently than frontal attacks. The simulation must take into account the time and space factors associated with large unit movements (division and corps) and the differences between heavy and light units. All aspects of army aviation must be replicated (aircraft and command and control). All mission profiles must be represented, e.g., Joint Air Attack Team (JAAT), air assault, airborne, reconnaissance,

logistics, and air traffic services. The simulation must allow all units, to include combat and combat service support units to be committed to combat operations in response to threats in a rear area.

(iii) Fire Support. The simulation must portray the differing effects of fire support systems against targets in varying environments. The effects of precision munitions against specified targets must reflect in the portrayal of targeted unit's capabilities and characteristics, e.g., a unit that loses its accompanying radars due to damage will show a change in its radar emissions.

(iv) Engineers. The simulation must portray the ability of engineers to modify the battlefield (and supporting infrastructure) for mobility, countermobility, survivability, and sustainment engineering. The simulation must also portray the resulting affects of engineer activity on the actions of other entities in the simulation. This includes all types of engineering activity to include both combat and civil engineer tasks. The simulation must allow the commitment of engineer assets and resources down to squad and team level. The simulation must include the realistic portrayal of area damage control operations associated with rear operations.

(v) Air Defense Artillery. WARSIM 2000 must be capable of realistically modeling the detection, identification, engagement, and attrition of helicopters, manned and unmanned aircraft, and tactical missiles by air defense systems. Weapons Control Statuses, Air Defense Warnings, and Rules of Engagement must be able to be changed interactively and to vary by unit. The simulation must provide data to stimulate air defense unit command post tactical radar scopes and displays so that early warning information can be passed to supported units. WARSIM 2000 will portray airspace management techniques to include Weapon Engagement Zones, Restricted Airspace, and Air Corridors.

(vi) Combat Service Support (CSS). The simulation must be capable of providing and accepting CSS information to the level of detail and format, e.g., STAMIS, needed to train logisticians and CSS units from battalion through EAC, in CSS functions. These units operate in direct and general support of echelons from theater down to company level. This includes the interactions that these units would have with their higher, lower & adjacent units, with other services, and with supporting STAMIS and ADP systems reports and outputs in logistics exercises as well as in combat arms and combined arms exercises. The following logistics functions must be integrated to show the effects of degradation/attrition in one area affecting the other area.

(a) Maintenance. The simulation must model random reliability, availability, and maintainability (RAM) failures, battle damage assessment, recovery activities, manpower and parts availability, time to repair, collection and classification activities, repair of damaged equipment, and Standard Army Maintenance Systems (SAMS) reports. Maintenance activities simulated will include Organizational, Direct Support, General Support, and Depot levels of Maintenance.

(b) Transportation. The simulation must model the impact of road, rail, port, air, barge capacity, river transportation and movement (including barge), varying capacity pipelines (water, gas, oil, etc.), variable gage railways (not one generic size fits all), tunnels, and air delivery systems, for both fixed wing and rotary (Low Altitude Parachute Extraction System (LAPES), heavy drop, etc.) as it affects network congestion and the ability to support civilian and military unit movements. It must provide the capability to monitor programmed moves, and manage unprogrammed moves to meet the logistical demands of the training audience. Additionally, the simulation must model Reception, Staging, Onward movement and Integration (RSOI) through its various stages from

deployment through transfer of authority to the gaining command. The simulation must model Joint Logistics Over The Shore (JLOTS) operations.

(c) Supply. The simulation must model the receipt, storage, issue and status of all played NSNs at every CSS activity that will provide the selectable simulated Standard Army Retail Supply System (SARSS) outputs.

(d) Ammunition. The simulation will provide the visibility of receipt, storage and issue of ammunition at any point where ammunition is processed, down to the Department of Defense Identification Code (DODIC) level of resolution. It will provide selectable simulated Standard Army Ammunition System (SAAS) outputs.

(e) Liquid Logistics. The simulation must model, liquid logistics by product; the bulk capacity, receipt, storage and distribution of the products; and be able to monitor their consumption. Simulation generated damage or loss of fuel consuming equipment, liquid logistics storage or distribution assets must be reported.

(f) Medical. The simulation must model medical evacuation, patient status and regulation by SSN name and rank, surgical initiation and management, class VIII management, blood management, and bed regulation. It must simulate medical treatment and medical transfer facilities, and MEDLOG from division through Echelons Above Corps level. The simulation must provide the selectable simulated Army Medical Management Information System (TAMMIS) outputs. The simulation must model mass casualties and NBC contaminated casualties.

(g) Mortuary Affairs. The simulation must model the activities of concurrent return or internment and account for remains processed, evacuated and, as ordered, buried. It must provide visibility of remains held at any mortuary affairs element in the system, and, based upon casualty data from the Personnel system, account for patients that have died enroute to a medical treatment facility. The simulation must model NBC contaminated remains.

(h) Personnel. The simulation must track every soldier inbound to the theater from CONUS Replacement Centers and those in theater by SSN, name, battle roster number, grade, MOS/AOC and duty description. The SSNs, names, battle roster numbers, grades, MOS/AOC, and duty description must be able to be generated by the simulation based on the SRC/TOE/MTOE of the participating units. It must flow replacements from replacement centers, track medical returns to duty, report personnel casualty data and provide personnel strength reports. The simulation must portray the effect of replacement packages to sustain all BOS. Choice of individual, squad, crew, team, unit replacements and replacement technique from theater, corps, or division to gaining unit must be available to operators at each level. It must provide the selectable simulated outputs from the following systems: the Standard Installation/Division Personnel System (SIDPERS), Command & Control Strength Reporting System (C2SRS), Replacement Operations Automation Management System (ROAMS), Army Casualty Reporting System (ACRS), and future Force XXI Manning System (FMS). FMS includes LPXMED, a casualty estimator, and the Army Personnel Planning Software (APPS), a stratification program that estimates grade and MOS loss from a raw casualty estimate. Personnel information such as name, SSN, grade and MOS must track across all elements of the simulation, wherever those data elements are used.

(i) Host Nation Support. The simulation must support the capability to model

the use of Host Nation Support assets in support of CSS and combat support operations.

(j) Religious Support Operations. The simulation must accommodate the effects of religious support operations on the battlefield. In addition to the effect on human factors (paragraph 4.a.(1)(b)(v)), the simulation should provide information on simulated unit morale, cohesion, and perceptions to the training unit chaplain.

(vii) Command and Control

(a) Signal. WARSIM 2000 must realistically portray communications support to include considering items from host nation communications assets available to handle load caused by battlefield automation devices. Communications must be degraded as a function of, at a minimum, extended ranges, equipment malfunctions, weather, time of day, network overload based on combat activities and equipment destruction by hostile acts. Allow CSS functionality to take into account and consider communications and information systems, paths, and path requirements found at various command and control echelons, Command Posts, and locations.

(b) Electronic Warfare. The simulation must portray the effects of electronic warfare on communications, radar, and operations. This includes the ability to adversely affect both the training unit's and the simulated unit's communications systems, including the OPFOR.

(c) Deception. The simulation must allow units to implement deception plans and activities within the capabilities of their equipment and systems.

(d) Space. WARSIM 2000 must portray the products space systems provide (intelligence, communications, weather, environment, and position/navigation) at the appropriate echelon.

(d) Special Operations Forces. The simulation must portray the capabilities of small units to infiltrate and conduct missions (reconnaissance or destruction) against high value targets. The targets could include both military and civilian infrastructure, e.g., supply points, bridges, dams, or power installations.

(i) Special Forces. The simulation must also account for the ability of special forces personnel to develop and lead units from within the civilian population (unconventional warfare) and to improve the combat effectiveness of other existing forces. The simulation must portray the ability of Special Forces to move with less likelihood of detection than conventional forces and to enhance the accuracy of precision-guided munitions through the use of laser markers and transponders.

(ii) Rangers. The simulation must portray the Ranger unit's ability to operate in all weather and terrain at much higher efficiency than conventional infantry units. It must also portray the Ranger units' ability to operate deep inside enemy territory, e.g., deep penetration raids or interdiction or forced entry operations, as well as their capability to direct joint fires.

(iii) Special Operations Aviation. The simulation must portray the ability of fixed and rotary wing special operations aircraft to infiltrate and extract personnel from denied areas. This includes refueling in flight, longer flying time, conducting Forward Arming Refuel Point operations, search and rescue operations, coordinating air-space management, penetrating denied airspace,

and navigating map of the earth.

(iv) Civil Affairs. The simulation must portray the effect of decisions made regarding the civilian populace in a combat area. This must include at a minimum changes in refugee traffic, availability of foreign-nation support, and incidents of terrorism.

(v) Psychological Operations. The simulation must consider the impact of psychological operations on combat effectiveness. This includes the immediate and persistent effects on friendly, allied, civilian, and neutral forces of loudspeaker and leaflet operations, media broadcasts, and deception operations as evidenced by troop morale, defections, surrenders, terrorism, sabotage, civilian interference, counter-propaganda, etc.

(e) Joint Operational Environment. The simulation must portray the effects of space, air, naval, and amphibious operations on Army operations. This does not mean that the simulation must portray the actions of other services in detail, e.g., the replenishment activities of a carrier battle group. The simulation must portray those actions of the other services that affect the planning and execution of army operations, e.g., naval gunfire or amphibious support. A key example is the operation of intelligence collection assets from other services (as well as national assets) that have a critical impact on the planning and execution of army operations. In the absence of a joint training simulation, WARSIM must depict the CSS support normally provided by the Army to other services and allied forces, as well as that provided by other services and allied forces to the Army.

(f) Conditions for Operations.

(i) Nuclear, Biological and Chemical (NBC). WARSIM 2000 must portray the initial and residual effects of nuclear, biological, and chemical weapons employment. Projected, mobile, and fixed smoke effects and flame weapons will be included. The degradation effects of defensive measures, i.e. mission oriented protective postures, and the consumption of resources for restoration of combat, e.g., decontamination, will be an integral element of the simulation.

(ii) Night/Reduced Visibility. The simulation must portray the effects of night and reduced visibility conditions on operations.

(iii) Extreme physical environments. The simulation must portray the effects of operating in extreme environments such as jungle, arctic and desert environments.

(g) Mobilization and Deployment.

(i) Mobilization. The simulation must allow units to train on planning and executing mobilization. Mobilization considerations include the arrival of units to mobilization stations, personnel and equipment status, time for training to a given level of proficiency (including time at a Combat Training Center), and movement to a point of embarkation.

(ii) Deployment. The simulation must portray deployment activities. Deployment considerations include the movement to a point of embarkation by ground and air, movement via sea and air, and arrival at a port of debarkation followed by time to organize and move to a marshalling area or arrival at a point of forced entry and the immediate transition into combat operations. The simulation must allow units to arrive in theater at different times during the exercise. Training units must be able to make changes during the exercise in

deployment schedules affecting which units will deploy at what time and by what means. The simulation must portray sea and air deployment using military and civilian assets of the United States as well as the assets of other nations.

(h) Operational-level Movement. The simulation must give users the ability to conduct operational-level movements in theater and to benefit from posturing their force to gain an operational-level advantage.

(i) Post Conflict Activities. The simulation must portray events associated with post conflict operations. These events include reconstitution, redeployment, and demobilization. Considerations include the consolidation of units and materiel for transport within theater and out of theater, restoring order and supplementing civilian government institutions, and processing of personnel through demobilization stations.

(j) Operations Other Than War. The simulation system must allow commanders to train in conjunction with other national and international agencies. This includes the portrayal of non-aligned forces, non-combatant groups, and forces of unidentified or changing alliances.

(k) Enemy Prisoners of War (EPW). WARSIM 2000 must portray realistic events associated with Enemy Prisoners of War (EPW). This includes the production of EPW before, during, and after combat operations. Users must be able to perform the handling and evacuation of EPWs from the main battle area back to theater EPW collecting points.

(2) Linkages. The WARSIM 2000 system must include software and hardware that allows the simulation to link with other simulations and training events involving simulators or live instrumented vehicles.

(a) WARSIM 2000 must be designed so that when it links to other models that have competing or complementary functions, e.g., airspace management, a decision can be made to either "turn off" one of the models' function and allow the other model to assume the function for both, or for the models to co-exist. WARSIM 2000 must link to future DIS-compliant simulation models of other services such as the Enhanced Naval Wargaming System (ENWGS) of the Navy, the Air Warfare Simulation (AWSIM) or the National Air and Space Model (NASM) of the Air Force, and the Marine Air Ground Task Force Tactical Warfare System (MTWS).

(b) WARSIM 2000 must use DIS compliant methods to link with simulators such as the Combined Arms Tactical Trainer. The simulators will operate as units on specified portions of the battlefield. The link must be such that WARSIM system operators can allow units of simulators to enter and leave the simulation environment without disrupting the training exercise.

(c) WARSIM 2000 must use DIS compliant methods to link with training instrumentation and live instrumented players such as those at a tactical maneuver combat training center.

(3) Databases. The WARSIM 2000 system must have the ability to use, manipulate, input data to and extract data from a variety of databases to include organizational system databases and standard army management information systems using standard Commercial or Government Off-the-Shelf database management systems. Information must also be uploadable and downloadable by standalone personal computer to facilitate the database build process.

(a) HLA-Compliant. WARSIM 2000 must be able to link to HLA- compliant databases and use their information to affect the parameters in the model to include

being able to upload from or download to either contiguous or selected portions of the database. The interface with the databases must permit interactive exchange of data during exercises or batch processing for initialization and post-exercise data dumping.

(b) Scenarios. WARSIM 2000 must allow users to rapidly build and change scenarios. Building a scenario requires defining the units or organizations involved in the exercise to include their supporting/supported relationships, the terrain boundaries of the exercise, obstacles, the resources available to the units/organizations, and the initial environmental conditions to include weather and intelligence situation. The scenario preparation system must also create the databases needed to support designing and implementing the communications architecture supporting the training event.

(c) Modifications. The WARSIM 2000 databases must be capable of being readily modified between training events to handle data for systems of any nation or hypothesized land, sea, air, or space systems.

(d) Archiving. In addition to the standard data set to be archived, the system shall be capable of tailoring data to be archived to meet a unit's specific training objectives. This information includes the scenario databases and any other information available to support the AAR requested by the unit or the Center for Army Lessons Learned (CALL). Data will be archived with respect to time in order to facilitate examination of the dynamics of the battle. The system must also be capable of archiving data needed for verification, validation, test and evaluation.

(4) Simulation Support Modules (SSMs). The WARSIM 2000 system must have support capabilities beyond the battle simulation model in order to properly support home-station training exercises. The SSM is an umbrella concept for discussing the set of functions listed below, but an SSM need not be a single set of equipment that moves as a contiguous unit. The requirement is for the functions described for each component of the SSM to be present to support a training unit that is geographically remote from the main simulation hardware. The components have a requirement to be operated near the training unit and to continue to be near the unit after it moves. The goal is to be within an approximately 30 minute drive from the training command post.

(a) AARs. WARSIM 2000 must support units conducting After- Action Reviews (AARs). To do this it must have an AAR and Evaluation System (AARES) with the capability to record user specified events and data, to respond to specific questions regarding the history of the exercise, and to produce detailed answers in various formats all while the simulation continues to run. These formats include real-time three dimensional graphical displays on a portable screen (visible by a group of 25 people), printouts and overhead viewgraphs of units' locations (overplayed on maps with operations graphics), combat power and activities, statistical graphs of unit's resource consumption, and tabular outputs of data as well as text messages. AARES must also have the ability to insert and/or track special "probe" or high interest information to the training unit, to provide automatic detection of events based on common errors, and to compare "ground truth" information from the simulation databases with information in the units' tactical data systems to include the Tactical Decision support System (TDSS). AARES must accept, store, and playback selected portions of audio and video of an exercise during an AAR. AARES must accept and store manual and electronic input from observer controllers on site. AARES must be able to link with the AAR facilities at the Combat Training Centers. A single operator must be capable of using AARES to respond to questions and rapidly produce and store up to 100 outputs where the output consists of products. Potential After Action Review Products include:

- Dynamic graphical portrayal of the battle to date.
- Correlation of forces: Main and Supporting Efforts.

- Map laydowns to assess coverage: Radar, Artillery and Air Defense Artillery.
- Map laydowns of OPFOR artillery missions fired versus detected.
- Maps with overlays for maneuver, obstacles, fire support, contaminated areas, hydrology, trafficability and CSS.
- Loss Summaries: Friendly systems destroyed by OPFOR systems by type. OPFOR systems destroyed by friendly systems by type. Fratricide. Aircraft lost to each ADA weapons system. Personnel losses.
- Map or tabular comparison of Command Post image of the battle versus ground truth.
- Time phasing of orders and critical information receipt and dissemination.
- Sustainment flow of critical supplies and replacement personnel.

AARES must also provide the operator with a set of analytical tools/statistical functions such as are found in a spreadsheet, e.g., sum, average, median, standard deviation, variance, range, sort, and logical constructs. The operator must be capable of modifying existing information products or building new output displays using a built-in macro-language capability. AARES must be able to be operated near the training unit's location.

(b) Senior Controller. WARSIM 2000 must have a Senior Controller Workstation capability. The workstation user must be able to use the workstation to observe and affect the activity or dynamic scenario/entity characteristics occurring during the exercise at any location in the simulation network regardless of the size or location of the network. This includes observing both ground truth and the actual training unit information available in their command and control system. This workstation must be able to be operated near the training unit.

(c) OPFOR/Surrounding Forces. WARSIM 2000 simulation must permit the opposing forces (OPFOR) and surrounding forces (front, flank, and rear) to be controlled with a minimum number of trained personnel, e.g., one individual can control the operations of a division headquarters or regiment. The system must be capable of being changed between training events to reflect changes in doctrine, organizations, or procedures. The systems must be capable of portraying up to four different doctrines and organizations simultaneously, i.e., as multiple or composite threat forces during the same exercise. The OPFOR arrayed directly against the training units must be portrayed in a realistic fashion i.e., to the same resolution as all other forces. The majority of OPFOR controllers will be at a centralized location(s), but the system must permit a senior OPFOR/surrounding unit controller to be close to the training unit and to interact with the centralized OPFOR.

(d) Commander's Agility. The simulation system must provide a mechanism for the commander and his command group (up to six) to move about the battlefield to see the battlefield and to command the force from any location. The system must present the perspective as would be seen from the best viewing point (in terms of line of sight) in close proximity (i.e., within 25 meters) to a specified platform (air or ground) in the simulation based on the platform's current attributes (e.g., location, orientation, velocity). The users would be subject to attrition in the simulation based on the vulnerability of their platform and its activities in the simulation. The user must be able to adjust the orientation of the view and make adjustment to the view point while staying within 25 meters of the associated platform. Moving the view point beyond 25 meters from the associated platform will require moving the platform in the simulation to a new location. The system must be capable of being operated near the training unit's location.

(5) Security Levels. WARSIM 2000 must be able to operate in an unclassified mode as well as to accommodate multi-level security requirements for training with classified data in classified scenarios. This includes the ability to transmit classified data over the distributed network, use classified data as part of the model parameters in a classified database, media

storage, purging of classified data from systems, denial of unauthorized users, etc. Required classification levels include secret for the bulk of the system and top secret- special compartmented information for intelligence models.

b. Logistics and Readiness.

(1) Reliability and Maintainability (R&M). The WARSIM 2000 simulation system will support training exercises whose duration ranges from 1 to 30 days, 24 hour as per day. R&M goals are defined in the RAM rationale report. The goal is for the system to be capable of restarting no more than one hour after correction of a full system failure from the point of failure.

(2) PDSS. A system for post-deployment software support (PDSS) must exist to support the correction of errors in the software design and implementation.

(3) Setup/Breakdown. Components of the simulation support modules that must move to support mobile command posts must be fully operational and capable of supporting training within 30 minutes after arriving near a training unit's new location. The operator of each moving component must be able to take it from an operational state to a ready for movement state in less than 10 minutes. The communications component of the simulation support module must be able to maintain communication between the training unit and the simulation while the unit is moving.

c. Critical System Characteristics. The simulation system must support training that occurs in a variety of field and climatic conditions. Selected components of the system that accompany units (the SSMS), as defined through the evolution of the operational concept, must be capable of operating using internal or foreign power supplies, withstanding normal training environments such as extremes of temperature, humidity, dust and sand, and operating without interference from normal commercial or private electromagnetic outputs such as from radio or television stations. They do not have to be capable of operating in hostile nuclear, chemical or electronic environments.

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5. Integrated Logistics Support.

a. Maintenance Planning. The support concept for WARSIM 2000 will be determined through an analysis of reasonable alternatives. Any maintenance plan developed must cover all users and not leave a user to arrange for their own maintenance.

b. Support Equipment. WARSIM 2000 will be designed to be maintained by standard test equipment and will include fault isolation capabilities to diagnose failures at a level commensurate with the final support concept.

c. Human System Integration.

(1) Man-Machine Interface. The simulation system must not require any special training of the training user for its operation. All training-unit interaction with the simulation other than the virtual environment, must be via organizational command and control systems which have their own inherent training requirements. The simulation system should require the training unit to perform all of the tasks that it would have to perform in combat without automating any action for the training unit.

(2) Manpower Support. The goal is for WARSIM 2000 to be operated by a technical support staff and role players with fewer than one third of the personnel it takes to support current simulations.

d. Computer Resources.

(1) Open Architecture. The simulation system computers must comply with emerging standards for "open architecture" and DIS based on a POSIX- compliant operating system.

(2) Hardware Platforms. Users must be able to interact with the simulation using their organizational command and control systems and supporting communications systems such as the Army Tactical Command and Control System (ATCCS), the Standard Theater Army Command and Control System (STACCS), the Army WWMCCS Information System (AWIS) Defense Message System (DMS), or its replacement system, the Army Global Command and Control System (AGCCS/GCCS). This includes the requirement for the training audience to be able to interact with the simulation using ATCCS Common Hardware-compatible personal computers.

(3) Voice Interface. A unique user-interface requirement is the need for unit personnel to interact directly with the simulation via voice instructions using organizational communications systems, i.e., the simulation must be able to recognize a multitude of voice commands as well as generate appropriate voice responses or independent reports.

(4) Modular Software. The simulation must be designed in a modular fashion that permits distributed computing. Standards and protocols must be designed such that distinct models can have individual model configuration control. The requirement is for each model to be designed so that it can be changed and improved without affecting the design of the other models comprising the simulation system.

(5) Model Parameters. The simulation must be designed so that all data, e.g., parameters for system performance, rules for expert systems, addresses for network nodes etc., are not part of the simulation software itself. WARSIM 2000 must allow training support personnel to make changes in scenarios, input parameters, rules, networks structures etc., during an exercise with minimal disruption to the exercise (see paragraph 4.a.(3)).

(6) Magnitude of Support. The computers supporting a single WARSIM 2000 site must be flexible enough to support (6 -10) independent, low- echelon, brigade exercises simultaneously or a single division, corps, or theater exercise comprising (3 - 5) echelons of command. One must also be able to link multiple WARSIM 2000 systems together to support multi-corps or theater exercises that are globally distributed.

(7) Software Standards. The software comprising WARSIM 2000 must be documented to support a thorough process of maintenance, enhancement, verification, validation, and accreditation.

(8) System Integrity. WARSIM 2000 must incorporate sophisticated protection against unauthorized access to the simulation system and theft, corruption or destruction of software or data due to computer viruses.

e. Other Logistical Considerations. Permanent, environmentally controlled facilities for fixed site equipment must also include storage areas for simulation support systems. The simulation support systems must be designed to operate out of temporary facilities that may or may not be environmentally controlled. Selected facilities must be capable of supporting exercises being run in a secure mode.

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6. Infrastructure Support and Interoperability.

a. Automatic Data Processing and Communications Equipment.

(1) Interfaces. Training unit personnel will use their organizational systems for all incoming and outgoing communications and data transfer with the simulation. WARSIM 2000 will have to be completely integrated with each component of the organizational systems from tactical through operational level, e.g., ATCCS, STACCS, AWIS, or AGCCS/GCCS. WARSIM 2000 must be able to send and receive information in the appropriate format via the media employed by the system or by the appropriate Modular Reconfigurable C4I Interface (MRCI) common modules.

(2) Communications. The WARSIM 2000 system must be capable of using or providing several types of secure terrestrial and satellite communications support for training exercises.

(a) Unit-to-Simulation. It must have a means for allowing the unit to interact with the simulation when the simulation interface is beyond the unit's tactical communications range due to homestation training.

(b) System-to-System. During large exercises, multiple senior controller, AAR analysts, and OPFOR/surrounding forces controllers workstations must be able to link to each other, from field locations, with a secure communications capability for carrying video, voice, text, and graphics.

(c) Unit-to-Unit. To support an integrated training exercise involving units at separate home stations that are not within doctrinal communications distances, the system must provide the ability to link their communications systems.

b. Transportation and Basing. The hardware of the WARSIM 2000 system can be considered as being in two sets. One set contains the computers that operate out of a fixed facility for running the simulation model(s) and will not need to be moved once established. The second set consists of the SSMs that will be located at the site where the unit is training. The SSMs must be capable of stand-alone operation without having to depend upon the training unit for support, either for power or movement. This module must be able to move or be moved so that it can continue to support when the unit command post moves. The module must be able to move or be moved to a mature field location, i.e., a location that could be reached by a commercial automobile.

c. Standardization, Interoperability and Commonality. The WARSIM 2000 simulation will be employed in support of exercises that train units from other services as well as other nations. As such it must use DIS-compliant standards to enable it to link in a seamless (no man-in-the-loop) fashion with other services' simulations and communications systems.

d. Mapping, Charting and Geodesy Support (MCG). The WARSIM 2000 simulation must use Defense Mapping Agency (DMA), LANDSAT, and SPOT or other terrain data that is in the DIS-compliant format or meets standards established by the U.S. Army Topographic Engineering Center, Fort Belvoir, VA. WARSIM 2000 will need products that can cover contingency mission areas (South West Asia, Latin America) as well as major training areas to include those in Germany, Korea, Alaska, Hawaii, and Kansas/Missouri.

e. Environmental Support. The computers and ancillary equipment used to run the WARSIM 2000 battle model(s) will operate from fixed facilities that are environmentally controlled to system manufacturers' specifications. The SSM components will operate close to the training unit.

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7. Force Structure. Fielding plans will depend upon the final system design. As such, the

requirements will evolve as the system becomes more defined. The current concept calls for a combination of semi-centralized management of assets with decentralized execution of training.

a. The number of fixed sites is 10, not including the WARSIM 2000 Regional Training Center (RTC) fixed site facility. The following locations are candidates for an RTC: Fort Leavenworth, KS (a double capability); Fort Lee, VA; Fort Hood, TX; Fort Lewis, WA; Fort Bragg, NC; Fort Irwin, CA; Fort Polk, LA; U.S. Army Europe, U.S. Army Pacific, and a Reserve Component location.

b. In addition, Simulation Support Modules (SSM) will be located as required at unit locations and TRADOC institutions remote from the RTC site; the exact number of SSMs will be determined later.

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8. Schedule Considerations. Initial Operating Capability will be defined as having one complete set of software and hardware installed at Fort Leavenworth. Target date is FY 99. Full Operational Capability will be obtained when all software and equipment is operational at all sites with a target date of FY 03.

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[ANNEX A: Rationale](#)

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Annex A (Rationale) to ORD for WARSIM 2000

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Annex B (Coordination) to ORD for WARSIM 2000

Annex C (Training Strategy) to ORD for WARSIM 2000

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2. Simulation Functional Characteristics.
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5. Supporting Capabilities.
6. Classified Data.
7. Logistics and Readiness.
8. Critical System Characteristics.
9. Integrated Logistics Support.
10. Infrastructure Support and Interoperability.
11. Force Structure.

Appendix 1 (References)

Appendix 2 (Glossary)

Appendix 3 (Operational Mode Summary/Mission Profile)

Appendix 4 (RAM Rationale Report)

1. Premise. WARSIM 2000 must provide a high quality environment in which commanders and battle staffs can train. Commanders train their units so that they can function under combat conditions. A critical part of effective training is the assessment of what tasks need training. Improving the realism of a simulation will increase the number of tasks that a commander can assess as well as improve the accuracy of his assessment. By providing commanders "realistic" battlefield conditions, WARSIM 2000 will provide them a tool for improving the training and the combat effectiveness of their battle staffs. Thus, a common rationale for many of the system characteristics is realism. Another major rationale for system characteristics to use technology to reduce the overhead associated with preparing for, executing and assessing training.

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2. Simulation Functional Characteristics.

a. General Attributes. WARSIM 2000 will be used primarily to support exercises involving a single corps and/or its subordinate units. It will also support multi-echelon theater exercises including units down to corps headquarters and their associated support units. Supporting larger exercises involving multiple corps and their subordinate units will require linking two or more systems together since each system is required to support a corps. Weather affects all aspects of planning and executing operations. Units need detailed weather information to properly consider the effects of weather on operations and to execute their planning tasks. Varying the weather over the area of interest for large-scale units will force commanders to consider its effects on their different assets. A detailed intelligence preparation of the battlefield sets the foundation for planning and synchronizing operations. The terrain of the simulation must accommodate the level of detail used by training units so they can assess their performance on the use of terrain. The simulation must be able to run at varying times to give the commanders flexibility in designing

their training.

b. **Conditions and Constraints.** The simulation must allow units to train in an environment that enables them to employ their doctrine in a wide variety of scenarios. The simulation must provide the conditions that will allow the individuals in the command posts to perform their tasks to standard in order for the training to be effective. Each echelon in the Army from fire team to corps has assets unique to the echelon to perform its missions. These special systems are usually found in small numbers at each echelon and they are employed in a geographically dispersed mode. In order for the commander to properly employ these assets the simulation must treat them as they are employed and not in an aggregated manner. Subordinate unit reports form the basis for action by command posts. The simulation must provide command posts the reports they would expect to receive from their subordinate and surrounding units in an actual situation so that the receiving command post does not get an unrealistically accurate or timely intelligence picture. Simulating the effects of sustained operations on soldiers and units will force commanders and staffs to consider the combat effectiveness of their units when determining force allocations for missions. The simulation must provide unexpected events (mistakes) so that the command post trains under conditions closer to what it would experience if it was controlling actual units. Few Army units will operate in isolation on the battlefield. Coordination and information flow between units enables a commander and his command post to synchronize the activities of their unit with the surrounding units. Providing information from simulated units will provide the training command post with an adequate intelligence picture. Having simulated units request information from the training command post will provide the training unit the stress of having to meet requests from other units. Different echelons expect different types of reports from their subordinates and provide different types of orders to them. It would be inappropriate as well as unrealistic for the simulation system to provide a corps and brigade the same input and output features.

c. **Battlefield Operating Systems (BOS)** . The BOS frameworks captures the details of operations necessary to portray operational problems in the high resolution necessary to stress commanders and their battle staffs. Each operating system must be portrayed to stress all the members of the battle staff to synchronize their efforts in support of the commander.

d. **Special Operations Forces.** Special Operations Forces have unique capabilities that make them a valuable resource for commanders. These capabilities must be available to be stressed and exploited in the simulation environment.

e. **Joint Operational Environment.** In the future, the Army will deploy and fight as part of a joint or combined effort. The division of warfighting capabilities among the services and the planning/coordination procedures that Army forces must follow to use those capabilities makes it essential that the Army train with representation of the other services' capabilities on the battlefield.

f. **Conditions for Operations.** Units must be able to train in scenarios where the conditions span the gamut from arctic to desert since units deploy into those environments.

g. **Mobilization and Deployment.** Future missions of the Army will require forces to mobilize. A major planning factor for active component units is the acceptance of round-out and round-up units. WARSIM 2000 will also be used by reserve component units whose first mission essential task is to mobilize. The contingency orientation of our future force will place a high premium on our ability to deploy. Portraying deployment with a seamless transition into combat and also concurrently with combat operations will enable commanders to train their commands on a broader set of tasks in an integrated fashion.

h. **Operational-level Movement.** Portraying operational-level movement is key to stressing the commander's and battle staffs mental agility.

i. **Post Conflict Activities.** A unit's missions do not end with the last shot fired. Units must train on their missions that occur after conflict has ended.

- j. Operations Other Than War (OOTW). OOTW will play an increasingly important role in unit missions.

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3. Linkages. Army units will be training in events that involve command posts from other services or other nations. WARSIM 2000 will not be designed to meet the detailed needs of other than Army forces, so the other services will have their own simulation. Since WARSIM 2000 will be designed to portray some of the other service capabilities there will undoubtedly be overlaps between model functionalities. Designing WARSIM 2000 to routinely accommodate linkages within the exercise scenario will increase its flexibility to support training in the joint arena. Linkages to simulators will enable commanders to use high resolution man-in-the-loop simulators to create part of the training environment, both for the units in the simulators who must train as part of a larger scenario as well as the battle staffs who must deal with actual subordinate units. Enabling the simulator units to move in and out of the simulation will permit simulator units to train as part of the larger scenario for several hours but not require them to be manned for 244 hours a day. Linkages to live instrumented vehicles will enable units to use the simulation to portray the effects of joint capabilities and surrounding forces on the battle space beyond the confines on the training area.

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4. Databases.

- a. DIS Compliant. In order to meet the standards for Distributed Interactive Simulation, WARSIM 2000 must be DIS compliant.
- b. Scenarios. Simulations and training scenarios depend upon databases. The ability of a simulation to support a variety of scenarios in a responsive manner is partly a function of the resources one must expend to change the data. A rapid scenario building capability will conserve resources and provide commanders a responsive training simulation.
- c. Modifications. One must be able to easily update the data supporting WARSIM 2000 since doctrine, weapons systems, unit organizations, and threats change over time.
- d. Archiving. WARSIM 2000 will generate enormous amounts of data during training. Providing data that has been defined prior to a training event will support overall assessment programs or the Center for Army Lessons Learned (CALL) database system. Verification, validation, test, and evaluation are all functions that will require data to be extracted from the system.

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5. Supporting Capabilities.

- a. AARs. After Action Reviews (AARs) are the point in a training event where the training unit assesses what has happened, why did it happened and how can they improve their performance. Simulations can provide valuable information as part of an overall program to support assessment. Every AAR is different since they are tailored by the unit to match the training event. The time-sensitive nature of AARs and the set of the personnel that attend mandate that training units conduct AARs close to the training location. Multiple types of products and displays provide a unit flexibility in the information they can use during their AAR. To tailor the AAR to the commander's training objectives, the operator needs the ability to easily define a desired product and then rapidly display the product without being limited to a standardized set of data products.
- b. Senior Controller. The Senior Controller supports the commander in using the simulation to

support his training. The complexity and potential dispersion of operations demands that he or she be able to observe the conduct of the exercise from a single point. The trainer must be able to make changes to the simulation situation to cause events to unfold that will allow the unit to meet the training objectives.

c. OPFOR/Surrounding Forces. A critical element in the effectiveness of simulation-supported training is the presence of a thinking opponent and surrounding forces. The system must be capable of being operated with a minimal number of personnel to reduce the personnel overhead associated with operating the system.

d. Commander's Agility. Commanders move around the battlefield to see for themselves the critical points of the operation and improve the immediacy and accuracy of their image of the battlefield. This capability is not a "stealth" capability. The display will be linked to a particular entity on the battlefield and be subject to the actions affecting that entity on the battlefield so individuals can train on the advantages and disadvantages of going forward on the battlefield.

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6. Classified Data. Units train using both unclassified and classified scenarios.

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7. Logistics and Readiness. Routine training exercises range from one day to two weeks in duration. Large-scale exercises may last as many as 30 days to include deployment and redeployment. The fast pace of modern combat demands that the system be able to restart no more than an hour after failure. This is especially important in institutional use where the training time is limited.

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8. Critical System Characteristics. Units will use the simulation in all training environments. This includes training once deployed overseas prior to the onset of hostilities.

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9. Integrated Logistics Support. The logistics support requirements for WARSIM 2000 are needed to ensure that unit commanders and schools have a flexible simulation system. The system's flexibility will improve training (computer to communications system linkages) as well as reduce the resources required to support training. The requirements will also ensure that the system has a sound technical basis for efficient expansion and growth over its lifetime.

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10. Infrastructure Support and Interoperability. These requirements address the need for developing a system with integrated support for home-station training as well as deployed units. Using Army standards for development will ensure a commonality between the organizational systems and the simulation systems as well as make simulation linkages both feasible and affordable.

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11. Force Structure. The force structure is designed to support the Total Army with efficient use of resources.

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Appendix 1 (References) to Annex A to ORD for WARSIM 2000

Appendix 2 (Glossary) to Annex A to ORD for WARSIM 2000

Appendix 3 (OMS/MP) to ORD for WARSIM 2000

Appendix 4 (Reliability, Availability, and Maintainability (RAM) Rationale Report to Annex A to ORD for WARSIM 2000

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2. FM 100-7, The Army in Theater Operations.
3. FM 100-8, Combined Army Operations.
4. FM 100-16, Support Operations for Echelons Above Corps (EAC).
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15. Army Training and Evaluation Plan 71-100 Mission Training Plan for Division Command Group and Staff.
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Appendix 2 (Glossary) to Annex A to ORD for WARSIM 2000

AAR After Action Review
AARES After Action Review and Evaluation System
ATCCS Army Tactical Command and Control System
AWIS Army WWMCCS Information System
AWSIM Air Warfare Simulation
BCTP Battle Command Training Program
CALL Center for Army Lessons Learned
CAS3 Combined Arms and Services Staff School
CATS Combined Arms Training Strategy
CATT Combined Arms Tactical Trainer
CGSC Command and General Staff College
CPX Command Post Exercise
CSS Combat Service Support
CSSTSS Combat Service Support Training Simulation System
CTX Combined Training Exercise
DIS Distributed Interactive Simulation
DMA Defense Mapping Agency
EAC Echelons Above Corps
ENWGS Enhanced Naval Wargaming System
EPW Enemy Prisoners of War
FM Field Manual

IPB Intelligence Preparation of the Battlefield
JATT Joint Air Attack Team
JTX Joint Training Exercise
MAPEX Map Exercise
MCG Mapping, Charting and Geodesy
MNS Mission Needs Statement
MTP Mission Training Plan
MTWS Marine Air Ground Task Force Tactical Warfare System
NBC Nuclear, Biological and Chemical
NSC National Simulation Center
ORD Operational Requirements Document
PDSS Post Deployment Software Support
SAMS School of Advanced Military Studies
SOP Standing Operating Procedure
SSM Simulation Support Module
STACCS Standard Theater Army Command and Control System
STAFFEX Staff Exercise
STAMIS Standard Army Management Information System
TAC CP Tactical Command Post
TACSIM Tactical Simulation
TADSS Training Aids Devices Simulations and Simulators
TOC Tactical Operations Center
WFX Warfighter Exercise
WWMCCS World-Wide Military Command and Control System

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Appendix 3 (OMS/MP) to ORD for WARSIM 2000

1. Premise. Warfighter's Simulation (WARSIM) 2000 will be used to support the training of commanders and battle staffs from the Total Army as well as the training of students in Army schools in planning and conducting operations from across the operational continuum in joint and combined scenarios. There will be essentially three different modes of employing the WARSIM 2000 system: Multi-echelon Command Post Exercise (CPX), Single Echelon CPX, and seminar mode. In each of these modes, the WARSIM 2000 system may connect to user-supplied equipment (such as computerized command and control systems) via commercial communications devices. The performance characteristics of hardware and software that are not part of the WARSIM 2000 system will not be considered as WARSIM 2000 performance characteristics.

2. Operational Mode Summary (OMS).

a. Assumptions. The OMS is based on the following assumptions:

(1) The WARSIM 2000 system will be used by units from battalion through Corps to support the implementation of their Combined Arms Training Strategies. WARSIM 2000 will also support numbered Army, Joint Task Force and Unified command training events as well.

(2) A single WARSIM 2000 system will be capable of supporting the training schedule established by a Corps and its associated units. This schedule will be based on having 50 weeks available for training per year with two non-training weeks for New Years holiday. A generic corps will have the following associated units that will conduct independent events: 3 divisions, 12 division and 15 non-division brigades. Non-division combat and combat support units will conduct independent training events.

(3) A multi-echelon exercise may involve from Corps down through battalion headquarters training simultaneously in a single scenario.

(4) The simulation system will be able to support several (up to six) independent single-echelon CPXs and/or seminars occurring simultaneously.

(5) Hardware and non-developmental software maintenance support will be provided by contractor personnel.

(6) Users will schedule and tailor their events to meet their training strategies but there will be sufficient time for contractors to perform preventive and corrective maintenance outside of scheduled training events.

(7) The bulk of the simulation system equipment will be housed in facilities designed to meet its environmental constraints.

(8) The simulation support modules will support users in their normal training environment. Expected environmental conditions are listed in Table I.

Table I. Expected Environmental Conditions for the Simulation Support Modules.

Climatic Conditions: Hot 10%; Basic 90%; Cold 0%; Humidity 10-90%

(9) WARSIM 2000 will support training that occurs primarily during peacetime. While it may support training that occurs during wartime, there will be no additional tasks or missions that it must perform during that training. WARSIM 2000 will not have any wartime-specific missions.

(10) Once a training event begins, WARSIM 2000 will operate without planned interruption until the end of the event. Therefore, the Operational Time (OT) and Calendar Time (CT) will be the same.

b. Operational Mode Summary Table. Based on the frequency of events listed in the training strategy (Annex C) and the assumptions listed in paragraph 2.a, the OMS is listed in Table II.

Table II. Relative frequency of each type event

| Event | Annual # of Events | % of Total |
|-----------------------------------|--------------------|------------|
| Multi-echelon CPX (198 hrs OT/CT) | 29 | 11.0 |
| Single Echelon CPX (78 hrs OT/CT) | 147 | 55.7 |
| Seminar (54 hrs OT/CT) | 8 | 33.3 |

3. Mission Profile (MP).

a. Assumptions. The MP is based on the following assumptions:

(1) Command post exercises will run for 24 hours a day.

(2) Data input will be finished prior to the commencement of communications checks.

(3) Communications checks will happen immediately prior to the commencement of the CPX.

(4) Each day of training will require two hours for After Action Review. After Action Reviews will occur concurrently with the running of the CPX with the exception of the last day of training.

(5) No separate train-up period is needed for each event as the training unit will be using their own organizational equipment to interact with the simulation.

b. Mission Profile Table. The Mission Profile (MP) is detailed in Table III.

Table III. Mission Profile in hours.

| Mission | Data Input | RadioCheck | Simulation | FinalAAR | OT/C |
|--------------------|------------|------------|------------|----------|------|
| Multi-Echelon CPX | 24 | 8 | 164 | 2 | 198. |
| Single Echelon CPX | 6 | 2 | 68 | 2 | 78.0 |
| Seminar | 6 | 0 | 46 | 2 | 54.0 |

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Appendix 4 (Reliability, Availability, and Maintainability (RAM) Rationale Report to Annex A to ORD for WARSIM 2000

EXECUTIVE SUMMARY

1. RAM Rationale Report (RRR) Status. The RRR for WARSIM 2000 has not been completed as of 26 Jul 93. The AMC Material Developer, STRICOM, is currently conducting architecture studies and documenting the Integrated Program Summary (IPS) which will define the configuration of the system and serve as the basis for the determination of the required RRR parameters. Planned completion date for the IPS is Aug 93. The summary of WARSIM 2000 system requirements defined in paragraph 2 below, will be used as the starting point for developing the RRR.

2. WARSIM 2000 System Requirements Overview.

a. The WARSIM 2000 Operational Requirements Document (ORD) is for development of computer software applications that will operate on an assembly of non-developmental commercial ADP hardware to support the unit training of battle commanders, their staffs, and personnel assigned to command posts for the Total Army, as well as the training of students in Army schools in the planning and conducting operations from across the operational continuum in joint and combined scenarios.

b. The objective of WARSIM 2000 is to meet unit and service school mission training plan requirements by providing a realistic simulated battlefield environment whereby commanders, battle staffs, and personnel assigned to command posts, working together, focus their warfighters and systems in countering threats across the operational continuum.

c. WARSIM 2000 is tied closely with emerging technologies such as Distributed Interactive Simulations (DIS) and open systems architecture protocols and standards. System effectiveness and efficiency is enhanced through direct linkage with the Army's organization command and control systems, reducing significantly the dependance on unit personnel required as role players, interactors, and in other training support functions.

d. The three mission profiles identified for WARSIM 2000 to support commander and battle staff training for the Total Army are:

(1) Multi-Echelon Command Post Exercise (CPX). A multi-echelon CPX may involve from Corps down through Brigade headquarters training simultaneously in a single scenario. The duration of a multi-echelon CPX will be from four (4) to nine (9) days requiring continuous operations for 96-198 hours, depending on the units involved.

(2) Single Echelon CPX. Single echelon CPXs are generally conducted by battalions and brigades and within the service schools. The training audience consists of the commander and battle staff of the unit being exercised set up in field command posts or mock ups, with minimum subordinate, higher, or adjacent unit personnel required in support. A single

echelon CPX tends to be more focused, being conducted over a 3-4 day period, requiring continuous operations for 60-78 hours.

(3) Seminars. Seminars will be conducted by active and reserve units, and institutions, over a 1-3 day period requiring 20-54 hours of continuous operations.

e. The most strenuous use of the system will be to support a Corps or Division multi-echelon CPX requiring mission support for 198 hours.

3. Material Developer Analysis. TBD NLT Aug 93.

4. Combat Developer Analysis. TBD. Combat Developer Analysis input will be formulated in part concurrent with Material Developer Analysis through participation in architectural reviews and related concept definition meetings.

5. Summary. Considering the success Corps Battle Simulation (CBS) in meeting RAM expectations in today's training environment, the future WARSIM 2000 system can be designed, produced, and assembled within an acceptable degree of tolerance to support the most strenuous use foreseen for the year 2000 and beyond. This will satisfy the user's needs.

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Annex B

Coordination Annex (Staffing Worksheet)

18 September 97

| ITEM NO. | PAGE NO. | PARA. | LINE NO. | RECOMMENDED CHANGES AND REASON | RESOLUTION |
|----------|----------|-------|----------|---|--|
| 1. | 1 | 1.1 | 9-10 | Scott AFB, Air Force Combat Climatology Center (CAPT Tony Moninski): Add "verified and" before "validated algorithms and databases". Rationale: None specified. | Incorporated. |
| 2. | 2 | 1.4 | 2 | Fort Monroe, WARFIGHTER XXI Directorate (Phyllis Malcolm): Need to look at "fee for service" in hardware leasing versus government owned. As new versions are developed and other new systems come on line, the hardware through a "fee for service" contract can be upgraded to required capability. The "fee for service" hardware contract will also allow cross over in other environments within TEMO. It is currently being looked at in the virtual environment for all upcoming S. E. Core (formally CATT) systems. Rationale: None specified. | Not incorporated. This is not a user requirement. It may be a Government cost saving requirement, but is within the purview of the material developer, STRICOM. As the contract has already been awarded with a specific hardware Bill of Materials and associated cost, it may be too late to change. |
| 3. | 3 | 1.5.1 | 13-16 | NSC (Frank Moon): Delete last sentence. Rationale: WARSIM is replacing all Army legacy systems. JSIMS is replacing all JTC systems. The "confederation" will not exist. | Incorporated. |
| 4. | | 2. | | Pentagon, DUSA-OR (Vern Bettencourt): Is there any classified data? If so, there is a threat. Change Threat paragraph up front. Rationale: None specified. | Incorporated. Inserted revised Threat paragraph from JSIMS. |

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| 5. | 4 | 4.1.1.3.1 | 7-8 | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete "All mission profiles must be represented."</p> <p>Add "All mission profiles must be represented, to include rotary wing air combat."</p> <p>Rationale: The replication of rotary wing air combat in WARSIM 2000 will enable warfighters to train as they fight. MAJ Allen Huber, Warfighting Futures Division, DOTDS, USAAVNC (DSN 558-2904), participated as USAAVNC representative to the WARSIM 2000 ORD version 3.0 Working Group in Aug 96 at Fort Leavenworth. He described in detail to MAJ Shelton, NSC, and the Maneuver BOS Working Group, why it is critical to include this functionality in WARSIM 2000. At the conclusion of the Aug 96 WARSIM Working Group, NSC briefed the inclusion of rotary wing air combat into the WARSIM 2000 ORD version 3.0, which included this statement: "All mission profiles must be represented; e.g., Joint Air Attack (JAAT), rotary wing air combat, air assault, airborne, reconnaissance, logistics, and air traffic services." The inclusion of rotary wing air combat in the WARSIM 2000 ORD version 3.1 would correct a perceived deficiency in the Corps Battle Simulation and other legacy simulations.</p> | <p>Not incorporated.</p> <p>Consolidated aviation references in a single location in para 4.1.1.5.1.</p> |
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| 6. | 8 | 4.1.1.3.1 | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete "All aspects of army aviation must be replicated (aircraft and command and control). All Army aviation mission profiles must be represented."</p> <p>Add "All aspects of army aviation must be replicated (aircraft and command and control). All Army aviation mission profiles must be represented; e.g., Joint Air Attack (JAAT), rotary wing air combat, air assault, attack helicopter operations, airborne, reconnaissance, logistics, and air traffic services. In addition, the full range of aviation sensor suites must be replicated (FLIR, Fire Control Radar, Image Intensification, low level Day TV, and Radio Interferometer Sensors). The low observable characteristics of our newer aircraft and the full spectrum of Aviation Survivability Equipment must be simulated."</p> <p>Warfighting Futures Division POC: LTC Russell Forshag, DSN 558-1048.</p> <p>Rationale: Required to develop simulation with fair fight capabilities.</p> | <p>Not incorporated. Consolidated aviation references in a single location in para 4.1.1.5. Deleted two sentences beginning "All aspects .." and ending with ".. air combat."</p> |
| 7. | 5 | 4.1.1.3.4 | <p>Fort Lee, TSM CSSCS (Richard Silva): Add "It must be able to interface with the Army Battle Command System (ABCS) and any of its component systems, to include CSSCS."</p> <p>Rationale: None specified.</p> | <p>Not incorporated. Comment has no meaning in context of the citation. Para 5.6 contains C⁴I interface requirement for ABCS.</p> |
| 8. | 5 | 4.1.1.3.4 | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Consider adding risk assessment and risk management to the description of C². USASC POC: MAJ Moon, DSN 558-2966.</p> <p>Rationale: None specified.</p> | <p>Not incorporated. The requirement to simulate doctrinal C² processes includes these risk areas, which have no additional requirements beyond those written in doctrine.</p> |

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| 9. | 6 | 4.1.1.3.4.56 | | <p>Scott AFB, Air Force Combat Climatology Center (CAPT Tony Moninski): Add "and space environment" after "weather".</p> <p>Rationale: None specified.</p> | Incorporated. |
| 10. | 7 | 4.1.1.3.5 | 2nd Bullet | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete: "compliment". Add: "complement".</p> <p>Rationale: Convention.</p> | Not incorporated. Intelligence paragraphs have been rewritten. |
| 11. | 9 | 4.1.1.3.6 | | <p>Fort Rucker , Gunnery & Aviation Systems Division (Dr. Elizabeth Plumb): Add paragraph 4.1.1.3.6.2 Aircraft Survivability Equipment (ASE). The simulation must include the capabilities and limitations of electronic attack (use of the electromagnetic or directed energy to attack personnel, facilities, and equipment with the intent of degrading, neutralizing, or destroying enemy combat capabilities including actions taken to prevent or reduce the enemy's effective use of the electromagnetic spectrum through jamming, destruction, and electronic deception), electronic protection (actions taken to protect personnel, facilities, and equipment from effects of friendly or enemy electronic warfare actions that degrade, neutralize, or destroy friendly combat capabilities), and electronic support (actions tasked by, or under the direct control of, an operational commander to search for, intercept, identify, and locate sources of radiated electromagnetic energy for immediate threat recognition in support of tactical operations and actions such as threat avoidance, homing, and targeting). ASE portrayal should include jamming, decoys, signature, signature reduction and suppression, and warning. The ASE systems should be portrayed as fully operational systems and partial system failure (one piece of equipment failed) and environmental and terrain effects. (Appendix G, FM 1-114)</p> | Not incorporated. Too detailed for the ORD. |

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| | | | | <p>Rationale: The addition of a separate paragraph on ASE would provide a needed addition to the concept of survivability. Even if ASE capabilities are incorporated into an aircraft entity, the requirement for it needs to be included in the WARSIM 2000 ORD. Will FAX under separate cover a memo from the CG, USAAVNC, to NSC requesting that ASE be included in battle simulations. Adding ASE, as well as ground vehicle jamming and decoy capabilities, creates realism and accuracy for scenarios. This addition supports MTP tasks.</p> | |
| 12. | 10 | 4.1.1.3.7 | 19 | <p>Fort Lee, TSM CSSCS (Richard Silva): In last sentence, change "logistics functions" to "CSS functions".</p> <p>Rationale: None specified.</p> | <p>Incorporated. New sentence will read, "The following CSS functions must be integrated to show the effects of degradation/</p> <p>attrition in one battlefield functional area affecting another battlefield functional area."</p> |
| 13. | 10 | 4.1.1.3.7.16 | | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete: "... produce doctrinally formatted ...". Add: "... produce doctrinally formatted Unit Level Logistics System - Aviation/Ground (ULLS-A/G) ...".</p> <p>Rationale: Some units' (e.g., AH-64) organizational/AVUM maintenance support is located at battalion level - not company level. ULLS-A/G needs to be incorporated into WARSIM if it is to replicate the proper level of maintenance at battalion level for certain types of units. Note: TAMMS (The Army Maintenance Management System) is a portion of ULLS-G that produces reports for ground units; ULLS-A produces TAMMS-A (The Army Maintenance System - Aviation).</p> | <p>Incorporated & added new acronym to Glossary. Sentence now reads, "... and produce doctrinally formatted Unit Level Logistics System - Aviation/ Ground (ULLS-A/G); Standard Army Maintenance Systems (SAMS); and The Army Maintenance Management System (TAMMS) reports (e.g., the 2406 and 1352 reports)."</p> |

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| 14. | 11 | 4.1.1.3.7.1 | 7 | Fort Eustis, Aviation Logistics School (CPT Vergez): Add: "The system must accommodate a two and three level maintenance system." Rationale: None specified. | Not incorporated. This is covered in paragraph 4.1.1.3.7.1 (Maintenance). |
| 15. | 11 | 4.1.1.3.7.1 | 12-14 | NSC (Russ Stoewe): Why the emphasis on "weapons systems" instead of "major end items"? Trucks are as important to a transportation unit as tanks are to an Armor unit. Rationale: None specified. | Partially incorporated. WSRO in the previous paragraph 4.1.1.3.7 identifies the peculiarities of weapon system replacement and will remain. However, changed "weapons systems" to "major end items" in paragraph 4.1.1.3.7.1 to accommodate the maintenance tracking of all major end items. |
| 16. | 11 | 4.1.1.3.7.2 | 6 | Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete: "... air delivery systems for both fixed wing and rotary ...". Add: "... air delivery systems for both fixed- and rotary-wing ...". Rationale: Convention. | Incorporated. |
| 17. | 11 | 4.1.1.3.7.3 | 1 | Fort Eustis, Aviation Logistics School (CPT Vergez): Add: "... and unit level logistics systems (ULLS) aviation and ground." Rationale: None specified. | Not incorporated. This is covered in the change with Item 13. |
| 18. | 12 | 4.1.1.3.7.6 | 1 | Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete "The simulation must model medical evacuation ...". Add: "The simulation must model both casualty evacuation (CASEVAC) and Medical evacuation (MEDEVAC)." POC: Vicki J. Baxter, DSN 558-9198. Rationale: Accuracy. | Incorporated & added new acronyms to Glossary. New sentence will read, "The simulation must model both casualty evacuation (CASEVAC) and medical evacuation (MEDEVAC), patient status and regulation by Social Security Number (SSN), name, rank, surgical initiation and management, class VIII management, blood management, and bed regulation." |

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| 19. | 12 | 4.1.1.3.7.65 | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete: "... Logistics (MEDLOG) from division through ...".</p> <p>Add: "Logistics (MEDLOG) from battalion through ...".</p> <p>Rationale: WARSIM is supposed to replicate operations from battalion to EAC level. It shall, therefore, replicate medical operations from battalion through EAC.</p> | <p>Incorporated. New sentence will read, "WARSIM 2000 must provide the capability to monitor Medical Logistics (MEDLOG) from battalion through EAC level."</p> |
| 20. | 12 | 4.1.1.3.7.67 | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete: "The simulation must portray mass casualties ...".</p> <p>Add: "The simulation must portray mass casualties, NBC-contaminated casualties, and casualties resulting from parasites or infectious diseases."</p> <p>Rationale: The future operational capabilities look to the development of means to combat parasites or infectious diseases. The need exists to train leaders to be aware of infectious diseases and steps which might be taken to prevent them.</p> | <p>Not incorporated. WARSIM doesn't require this level of detail.</p> |

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| 21. | 12-13 | 4.1.1.3.7.8 | <p>Fort Jackson, Army Adjutant General School (Jim Ard): Personnel. The simulation must track every soldier inbound to the theater and those in theater by SSN, name, grade, Military Occupational Specialty (MOS)/Special Skill Identifier (SSI), Branch/Area of Concentration (AOC) and duty description. The SSNs, names, grades, MOS/SSI, Branch/AOC, and duty description must be able to be generated by the simulation based on the Standard Requirements Code (SRC)/Table of Organization (TOE)/Modified Table of Organization and Equipment (MTOE) of the participating units. It must flow replacements from replacement centers, track medical returns to duty, report personnel casualty data and provide personnel strength reports. The simulation must portray the effect of replacement packages to sustain all BOS. Choice of individual, squad, crew, team, unit replacements and replacement techniques from theater, corps, or division to gaining unit must be available to operators at each level. It must provide selected extracts from Standard Installation/Division Personnel System (SIDPERS) formatted outputs. Personnel information such as name, SSN, grade and MOS must track across all elements of the simulation, wherever those data elements are used.</p> <p>Rationale: The paragraph above reflects changes required resulting from the elimination of battle roster numbers from emerging personnel systems.</p> | <p>Incorporated. Deleted both occurrences of the words "battle roster number" from the paragraph (4.1.1.3.7.8). Deleted words "Command and Control Strength Reporting System (C2SRS)" from next to last sentence. Paragraph now reads as it appears to the left, except with the deletion of the word "extracts" and the addition of the word "reports".</p> |
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| 22. | 13 | 4.1.1.3.7.8 | Fort Lee, TSM CSSCS (Richard Silva): Add following sentence before second to last sentence: "Personnel tracking will include the religion of individuals in support of Religious Support Operations; and Civilians, Local Nationals and POWs for feeding / Food Service Purposes." Rationale: None specified. | Not incorporated. Covered in paragraphs 4.1.1.3.7.9 and 4.1.1.3.7.10. |
| 23. | 12 | 4.1.1.3.7.83 | Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete: "... Special Skill Identifier (SSI) ...". Add: "... Special Skill Identifies (SSI), Additional Skill Identifier (ASI) ...". Rationale: In flow of replacements from replacement centers, a soldier's ASI may be critical information in getting the right person to the right place. | Incorporated & added new acronym to Glossary. New sentence will read, "The simulation must track every soldier inbound to the theater and those in theater by SSN, name, grade, Military Occupational Specialty (MOS)/Special Skill Identifier (SSI)/Additional Skill Identifier (ASI), Branch/Area of Concentration (AOC) and duty description." |
| 24. | 13 | 4.1.1.3.7.94-5 | Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete: " The capability to simulation the availability of host national critical resources (e.g., railroads, trucks, boats ..". Add: " The capability to simulation the availability of host national critical resources (e.g., railroads, trucks, boats, aircraft, fuel supplies ...". Rationale: Accuracy. | Incorporated. New sentence will read, "The capability to simulate the availability of host nation critical resources (e.g., railroads, trucks, boats, aircraft, fuel supplies, roads, waterways, and medical treatment facilities, labor and air bases) must be provided in the system." |

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| 25. | 13 | 4.1.1.3.7.12 | <p>Fort Jackson, Finance School (COL Edgar Stanton): Add: Paragraph 4.1.1.3.7.12 Financial Management Support. The simulation must track deployment costs into the area of operations and the costs of all classes of supply consumed down to the battalion level. Financial information such as Accounting Processing Code (APC), and Element of Resource (EOR) must track across all elements of the simulation, wherever those data elements are used. The system must simulate host nation, NATO (STANAG), and UN support agreements. The system must also be able to calculate the value of all goods and services, Assistance In Kind (AID), given and received under these agreements. It must generate a doctrinally correct SF 44 (PURCHASE ORDER - INVOICE - VOUCHER) for each local procurement action taken to fulfill needs that the standard logistics systems cannot support. The simulation must portray the effect of local procurement support to sustain all BOS. It must provide selected Standard Army Finance System (STANFINS) and Integrated Logistics Analysis Program (ILAP) formatted outputs. The simulation must enforce budgetary constraints and prompt resource managers to seek appropriate alternative sources of funding in support of the mission.</p> <p>Rationale: Financial management operations support the commander and the logistics process during all patterns of operations. Ignoring financial management operations will significantly reduce the training value to warfighters at all levels, logisticians, finance commanders and resource managers. Host nation, NATO, and UN support can provide significant resources to a commander. Because these agreements are politically sensitive in nature, accurately tracking and reporting the value of support given and received is vital.</p> | <p>Not incorporated. This only provides a unique planning or accounting tool for the Finance community. There is no benefit to the entire training audience. However, failure to plan for Finance Operations (soldier pay, allotments to families, etc.) does impact the morale factor identified in paragraph 4.1.1.3.7 (CSS). As for producing doctrinally correct SF 44's, WARSIM is not a training tool for filling out forms correctly. Again, failure to plan for purchase orders will affect training outcomes.</p> |
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| 26. | 14 | 4.1.1.4 | 9 | <p>Fort Jackson, Finance School (COL Edgar Stanton): Add: "The system will allow the identification of executive agency for specific missions."</p> <p>Rationale: The service identified as an executive agent is responsible for funding and or supplying an operation. This is a common occurrence during joint operations and represents a significant commitment of resources.</p> | Not incorporated. The identification of the executive agency will likely be either a training audience activity (supported by JSIMS in the joint environment) or a scenario 'condition' that will be determined prior to STARTEX and input manually; in either case, the simulation need not provide an automated process. |
| 27. | 14 | 4.1.1.4.1.22-4 | | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete: "The simulation will model the application of the Global Positioning System (GPS) for maneuver, intelligence and electronic warfare, aviation, and combat service support." Add: "The simulation will model the application of the Global Positioning System (GPS) for maneuver units (including aviation), intelligence and electronic warfare, combat support units, and combat service support units."</p> <p>Rationale: Aviation is part of maneuver.</p> | Partially incorporated. Changed sentence to read: "WARSIM 2000 will simulate the effects of GPS on navigation and location reporting for those units and platforms so equipped." |
| 28. | 14 | 4.1.1.4.1.52 | | <p>Fort Monroe, WARFIGHTER XXI Directorate (Phyllis Malcolm): Close up space between "unclassified/commercial".</p> <p>Rationale: None specified.</p> | Incorporated. |
| 29. | 14 | 4.1.1.4.1.7 | | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Perhaps 4.1.1.4.1.7 Weather Data might be combined with 4.1.2.2 Weather.</p> <p>Rationale: None specified.</p> | Partially incorporated. Deleted para 4.1.1.4.1.7 as redundant with para 4.1.2.2. |
| 30. | 15 | 4.1.1.4.2.2 | | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): The Generalized Air Mobility Model enables users to determine what equipment fits in a given aircraft.</p> <p>Rationale: None specified.</p> | Not incorporated. Comment makes no sense in the context of the citation. |

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| 31. | 15 | 4.1.1.4.3.1 | 4-7 | <p>NSC (Russ Stoewe): Reference "laser markers." Is a laser designator in the hands of an SF type inherently more accurate than one held by an 11B. Seems to me that the relationship of the laser designator to the munitions is an equipment one, completely divorced from who holds it.</p> <p>Rationale: None specified.</p> | Incorporated by deleting all after "...than conventional forces..." in referenced paragraph. Lasers are covered under Fire Support BOS. |
| 32. | 16 | 4.1.1.4.3.4 | 3-4 | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete: "... and incidents of terrorism."</p> <p>Add: "... incidents of terrorism, and effects of violations of local customs."</p> <p>Rationale: Potential scope of civil affairs.</p> | Incorporated. |
| 33. | 16 | 4.1.1.4.3.6 | 3 | <p>Fort Monroe, WARFIGHTER XXI Directorate (Phyllis Malcolm): Change "and to support joint SAR/CSAR operations," to read "to include supporting joint SAR/SCAR operations."</p> <p>Rationale: None specified.</p> | Incorporated. |
| 34. | 16 | 4.1.1.5 | | <p>Fort Eustis, Aviation Logistics School (CPT Vergez): Paragraph 4.1.1.5 (Army Aviation) is very terse and vague. The ORD should spell out how aviation maintenance and overall logistics is played through simulation. Add: "Simulation should include AVUM/ AVIM operations and their mobility shortfalls. WARSIM will remain dynamic to accommodate changes in MOS consolidations/deletions and restructure initiatives that will affect the aviation logistics work force. Additionally, WARSIM should accommodate aviation unique supply requirements and initiatives, i.e., Total Asset Visibility (TAV), Prime Vendor Support (PVS), and Just Right Logistics.</p> <p>Rationale: None specified.</p> | Not incorporated. Does not support a substantive change to the ORD. "AVUM/ AVIM operations" are covered in ORD. What are "their mobility shortfalls"? If reference is to current organic capacity to move maintenance assets, this (along with comment on "changes in MOS consolidations/deletions and restructure initiatives") is facilitated during each scenario generation and in the maintenance of the current FDB effort. The uniqueness of aviation supply, or all branch specific supply efforts for that matter, should be identified during the build of each separate CSS function. |

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| 35. | 16 | 4.1.1.5 | | <p>Fort Rucker , Gunnery & Aviation Systems Division (Dr. Elizabeth Plumb): Add paragraph 4.1.1.5.3. The simulation must portray IFF capabilities and procedures. Daily codes, challenges, and responses for the ADA and aviation included in the simulation. IFF coordination capabilities, limitations, and problems between and with Joint and combined arms should be portrayed in the simulation.</p> <p>Rationale: In support of MTP tasks.</p> | <p>Not incorporated. Insufficient justification for inclusion. Need specific MTP task identification and assessment of likelihood these tasks will become METL tasks.</p> |
| 36. | 16 | 4.1.1.5 | | <p>Fort Rucker , Gunnery & Aviation Systems Division (Dr. Elizabeth Plumb): Add paragraph 4.1.1.5.4. The Army Reprogramming Analysis Team (ARAT) process should be simulated in the mission planning and during mission performance. This process includes the update of doctrine and ASE mission data sets, changes to symbology that reflect specific theaters of operation, and changes to threat signatures. The changing threat radar signatures degrades aviation's ability to detect, suppress, and identify the enemy, resulting in disruptions to situational awareness. The simulation must reflect this degradation subsequent to the ARAT process and the increased capabilities after the ARAT process.</p> <p>Rationale: In support of MTP tasks.</p> | <p>Not incorporated. Insufficient justification for inclusion. Need detailed process description and operational concept to assess value added to WARSIM by inclusion.</p> |
| 37. | 16 | 4.1.1.5.1 | 1 | <p>Fort Eustis, Aviation Logistics School (CPT Vergez): Add: "The system should challenge users to anticipate ammo usage based on number of aircraft sorties."</p> <p>Rationale: None specified.</p> | <p>Not incorporated. Out of scope for the WARSIM program. The simulation presents doctrinally correct tactical situations; it is the training audience's responsibility to decide and act on these situations.</p> |
| 38. | 16 | 4.1.1.5.1 | 2 | <p>Fort Eustis, Aviation Logistics School (CPT Vergez): Add: "Downed Aircraft Recovery Team (DART) operations."</p> <p>Rationale: None specified.</p> | <p>Incorporated in rewritten para. Added new acronym to Glossary. See Item 39.</p> |

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| 39. | 20 | 4.1.1.5.1 | | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete "WARSIM 2000 will simulate aviation operations. This includes coordinating air-space management, penetrating denied airspace, navigating nap of the earth, and conducting Forward Arming and Refueling Point (FARP) operations."</p> <p>Add "WARSIM 2000 will simulate aviation operations. This includes Joint Air Attack (JAAT), rotary wing air combat, air assault, attack helicopter operations, airborne, reconnaissance, logistics, and air traffic services. Aviation operations includes coordinating air-space management, penetrating denied airspace, navigating nap of the earth, and conducting Forward Area Arming and Refueling Point (FAARP) operations."</p> <p>Warfighting Futures Division POC: LTC Russell Forshag, DSN 558-1048.</p> <p>Rationale: Accuracy, completeness.</p> | <p>Incorporated by deleting current paragraph in entirety, & replacing with following paragraph: "WARSIM 2000 will simulate Army aviation operations, including both aircraft and the command and control of aircraft. Mission profiles of Joint Air Attack (JAAT), rotary wing air combat, air assault, attack helicopter operations, airborne, reconnaissance, logistics, and air traffic services will be simulated. Aviation operations include coordinating airspace management, penetrating denied airspace, navigating nap of the earth, and conducting Forward Area Arming and Refueling Point (FAARP) and Downed Aircraft Recovery Team (DART) operations. The tactical advantage gained from advanced aviation sensor suites, including FLIR, Fire Control Radar, Image Intensification, low level Day TV, and Radio Interferometer sensors, will be simulated. The advantages of low observable technology and Aviation Survivability Equipment will be simulated."</p> |
| 40. | | | | <p>Fort Eustis, Aviation Logistics School (CPT Vergez): Logistics and readiness areas should address Mean Time Between Failure (MTBF) and additional supportability parameters that are not addressed in this ORD.</p> <p>Rationale: None specified.</p> | <p>Not incorporated. The automated reporting system will track logistics readiness for aircraft and ground equipment.</p> |
| 41. | 17 | 4.1.2.1 | 1&2 | <p>Fort Monroe, WARFIGHTER XXI Directorate (Phyllis Malcolm): Change "such that tactical considerations..." to "to allow tactical considerations..."</p> <p>Rationale: None specified.</p> | <p>Incorporated. Also changed "...will affect..." in the same sentence to "...to affect..." to make the sentence readable.</p> |

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| 42. | 17 | 4.1.2.2 | 7 | <p>Scott AFB, Air Force Combat Climatology Center (CAPT Tony Moninski): Change "accumulation (liquid or frozen)" to "accumulation (both liquid and frozen)".</p> <p>Rationale: None specified.</p> | Incorporated. |
| 43. | 17 | 4.1.2.2 | 8 | <p>NSC (Frank Moon): As reads "absolute humidity", to read "relative humidity".</p> <p>Rationale: Correct terminology.</p> | Not incorporated. Aviation Center specifically requested change to absolute humidity as the correct data item. |
| 44. | 17 | 4.1.2.2 | 9 | <p>Scott AFB, Air Force Combat Climatology Center (CAPT Tony Moninski): Change "solar, lunar light data" to "solar and lunar light data".</p> <p>Rationale: None specified.</p> | Incorporated. |
| 45. | 17 | 4.1.2.2 | 13 | <p>Scott AFB, Air Force Combat Climatology Center (CAPT Tony Moninski): Does "current real world weather existing at the time of the exercise" mean a live feed of weather data is required? Typically, surface weather elements are measured and reported only hourly, and certain upper air elements are measured every 12 hours. Using current real world weather seems impractical.</p> <p>Rationale: None specified.</p> | Not incorporated. Requirement is not for a live feed of local weather. It merely affords the Senior Controller the capability to use real, local weather at the time of the exercise on a manual entry basis, e.g., if it starts raining on the training audience, he can make it rain in the simulation. |
| 46. | 17-18 | 4.1.2.2 | 15 & 17-18 | <p>Scott AFB, Air Force Combat Climatology Center (CAPT Tony Moninski): Here it mentions "elements...change as often as hourly" (line 15) and "changes incorporated at least twice per day". These sound like weather requirements constrained by perceived or known real-world weather observing capabilities instead of training requirements. It is presently possible to produce "modeled weather" of 5 km spatial resolution at 18-20 vertical levels in the atmosphere at 1 minute temporal resolution. This could be used to generate realistic weather scenarios for use in WARSIM.</p> <p>Rationale: None specified.</p> | Not incorporated. Requirement is for the capability to alter the specified weather parameters manually at least once per hour if desired. Goal is to produce reasonable weather effects as may impact tactical operations at the levels of resolution modeled, not to generate realistic weather scenarios at a far greater cost. |

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| 47. | 20 | 4.1.2.4 | 6 | Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete: "... event dependent intelligence ...". Add: "... event-dependent intelligence ...". Rationale: Convention. | Incorporated. |
| 48. | 20 | 4.1.2.4.2 | 8 | Fort Monroe, WARFIGHTER XXI Directorate (Phyllis Malcolm): Change (friendly, neutral, hostile) to (friendly, neutral and/or hostile). Rationale: None specified. | Incorporated. |
| 49. | 20-21 | 4.1.2.4.3 | | Fort Huachuca, New Systems Training Office (Dennis Mitchell): Recommend the factor of weather be added. Rationale: In the decision making process for military operations, weather affects the terrain and troops. For example, weather was a vital consideration for the D-Day landings in June 1944. | Incorporated. |
| 50. | 23 | 4.1.3.1.9 | 3 | NSC (Maria Traynham): The ORD needs to include the requirement for diagnostic/ analytical equipment to test the complete network prior to an exercise and to identify problem areas during exercises. Add "and hardware" after "communications network" at the end of the third line. Rationale: None specified. | Incorporated. |
| 51. | 24 | 4.1.3.2.3 | 3rd bullet | NSC (Maria Traynham): Add "workstation hardware." There can be faults/downtime related to these items as well as the CPUs. Rationale: None specified. | Incorporated. Changed to read, "... attributed to workstation hardware or Central Processor Unit ...". |
| 52. | 25 | 4.1.3.2.8.21 | | Fort Monroe, WARFIGHTER XXI Directorate (Phyllis Malcolm): Change "critical events and" to "critical events with". Rationale: None specified. | Incorporated. |

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| 53. | 27 | 4.1.3.2.8.8 | | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Add: "Medical evacuation times."</p> <p>Rationale: Parallel to Casualty evacuation times.</p> | <p>Incorporated. Changed 6th bullet on pg 28 to read "Medical evacuation, to include medical evacuation times."</p> |
| 54. | 31 | 4.1.3.2. 17.1 | | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Add: "The AARES will enable trainers to identify by task number suggested changes to ARTEP and/or soldier's manuals."</p> <p>Rationale: No known system currently exists which provides a direct link between trainers in simulated training exercises and the developers of tasks in ARTEP and soldier's manuals. Because of the frequent turnover of personnel, excellent ideas on how to improve these documents can be lost. Relatively few individuals take the time to write DA Form 2028s. Developing an AARES with this capability could enable trainers to locate such information in a central location within the CALL or other database. TRADOC and other representatives to the 26 Jun 97 STAARS ICT appeared to endorse this concept.</p> | <p>Not incorporated. This is beyond the scope of AARES.</p> |
| 55. | 32 | 4.1.3.4 | 5-8 | <p>NSC (Jim Clary): The senior trainer is the Commander of the training audience unit. As such, he is a COL (BDE) or LTG (Corps). This individual does not need the capability to interface through a keyboard directly to the simulation.</p> <p>Rationale: He impacts the simulation and training environment through the use of his "DISTAFF" or directing staff. All he really needs is a telephone.</p> | <p>Partially incorporated. Rephrased sentence 3 (lines 5-8) as follows: "The senior trainer must have the capability from the CP training location to observe perceived truth and ground truth displays and to communicate back to the exercise control cell any required changes to be implemented into the simulation that are necessary to achieve training objectives."</p> |
| 56. | 32 | 4.1.3.6.2 | | <p>NSC (Maria Traynham): Add "maintenance and communications at the beginning of (...personnel, facilities...).</p> <p>Rationale: None specified.</p> | <p>Incorporated. Changed parenthetical expression to read: "(maintenance, communications, personnel, facilities, time, equipment, etc.).</p> |

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| 57. | 33 | 4.1.3.7 | <p>NSC (Maria Traynham): This paragraph is very vague. It should spell out that the system's hardware performance monitoring/data collection tools and LAN/WAN analysis data collection tools will be required.</p> <p>Rationale: None specified.</p> | <p>Partially incorporated. The development contractor must be left with the flexibility to develop the best hardware/software solution for the broad (by intent) technical control requirement. However, review of the paragraph in question did identify some improvements.</p> <p>Changed the paragraph to read (in entirety), "WARSIM 2000 will provide a technical control capability for the simulation system. Technical control is responsible for executing required immediate fixes and/or restarts. Technical control monitors distributed hardware, software, and communications to determine if they are running correctly. Technical control is responsible for fault prediction, detection, isolation, and correction, and check point management. The WARSIM 2000 systems will provide automated tools to assist technical control personnel in executing these activities."</p> |
| 58. | 36 | 4.3.1.4 | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Perhaps some appearance of internal inconsistency could be avoided by aggregating requirements for interoperability with real C4I and MRCI. See 4.3.1.4, 5.4.1, 5.6, 5.6.3, 5.7.1.2.3, 5.7.1.4.</p> <p>Rationale: None specified.</p> | <p>Not incorporated. Cannot find any internal inconsistency.</p> |
| 59. | 36 | 4.3.2 | <p>NSC (Maria Traynham): Add "WARSIM 2000 must meet the requirements for a trusted computer system based on DoD 5200.28.STD, Department of Defense Trusted Computer Evaluation Criteria."</p> <p>Rationale: None specified.</p> | <p>Incorporated. Valid requirement; added at end of para 4.3.2.</p> |

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| 60. | 37 | 5.4.2 | 1-3 | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete: "The goal is for WARSIM 2000 to be operated by a support staff of fewer than one-third of the personnel it takes to support current simulations.". Add: "The goal is for WARSIM 2000 to be operated by a support staff of fewer than one-third of the personnel it takes to support current CBS and large-scale exercises. The intent is to maintain the current level of staffing in TRADOC schools institutional training.".</p> <p>Rationale: The impact on training with simulations in a TRADOC school would be highly negative if the support staff were reduced by two-thirds of the current level. With training exercises involving 90-200 students, it would not be feasible to expect two individuals to carry the present load. Before lowering personnel staffing levels at the institutional level, suggest NSC permit TRADOC schools to identify and justify task load borne by support staff. Now have highly successful training in place and the cost of going backwards could eventually be measured in lives and equipment.</p> | <p>Not incorporated. The requirement is correct as stated. The WARSIM ORD is not intended as a manning document or work force justification document for individual BSCs.</p> |
| 61. | 38 | 5.5.1 | 5 | <p>Fort Monroe, WARFIGHTER XXI Directorate (Phyllis Malcolm): Change "Information must also be uploadable and downloadable by stand-alone personal computer to facilitate the database build process." to "Upload and download information capability must be available by stand-alone personal computer to facilitate the database build process."</p> <p>Rationale: None specified.</p> | <p>Incorporated. Also changed "stand-alone" to "stand-alone" (twice) and changed "Upload and..." to "An upload and...".</p> |

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| 62. | 38 | 5.5.1.1 | | <p>Fort Lee, TSM CSSCS (Richard Silva): Add as new paragraph: "Establish a Central Reference Database or File / WEB Server for common SRC / MTOE data, Exercise LINs (recommend using letter "O" as LIN prefix which is currently available because it can be confused with zero), Standard Planning Factors and reference data, maps, and standard data elements.</p> <p>Rationale: None specified.</p> | Not incorporated. Out of scope for the WARSIM program and duplicative of the FDB program. |
| 63. | 38 | 5.6 | 5 | <p>Fort Rucker , Gunnery & Aviation Systems Division (Dr. Elizabeth Plumb): Add "... Army Tactical Command and Control System (ATCCS), Aviation Mission Planning Station (AMPS), and ...".</p> <p>Rationale: The AMPS is part of the Army Battle Command and Control System and provides information/data into the AVTOC and TOC. AMPS also transfers information/data to and from joint INTEL sources for situational awareness.</p> | Not incorporated. Insufficient justification for inclusion. AMPS is not recognized as part of ABCS. Need detailed system description and operational concept to assess value added to WARSIM by inclusion. |
| 64. | 39 | 5.6.2.2 | 3 | <p>NSC (Jim Clary): Recommend that the phrase, "from field locations", be deleted.</p> <p>Rationale: None of the positions listed are in the field. They are located either at the RTC or a BSC. Agree that the communications listed are needed for these positions.</p> | Partially incorporated. Changed the word "field" to read "multiple". |
| 65. | 40 | 5.7.1.2 | 11-13 | <p>NSC (Russ Stoewe): I'm not sure what this FIM is. Is it the former SSM/CPIM/CPI? If so, are we now saying that it does not have to have its own power, that the TA will provide the power in the field?</p> <p>Rationale: None specified.</p> | Partially incorporated. The sentence is changed to read, "The power source for the FIM components must be flexible in that they must be capable of having their own internal power source, or use local commercial power sources, or use the tactical power generators of the unit(s) being trained." |

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| 66. | 40 | 5.7.1.2.1 | | <p>NSC (Jim Clary): The senior trainer, as the unit commander, does not need a workstation or access to any software. A senior instructor, in a school environment, also does not need access to any software. The video-teleconference link is OK, however, I feel that it may be overkill for the commander in the field.</p> <p>Rationale: The focus of these individuals is training event control, not workstation operator.</p> | <p>Partially incorporated. A "computer link" does not imply a "full up workstation". Agree a PC E-mail or voice link is sufficient. Sentence is rephrased for clarity and to delete specific mention of a video teleconference capability as a capability required. Deleted the phrase "video-teleconference" and replaced with the term "communications".</p> |
| 67. | 40 | 5.7.1.2.2 | 1-4 | <p>NSC (Russ Stoewe): What is the intent of this requirement? Who is using the CAF in the BSC and to whom in the TA is the CAF being extended (rather than the person in the TA having their own CAF).</p> <p>Rationale: None specified.</p> | <p>Incorporated. Deleted para 5.7.1.2.2; CAF is being deleted as a FIM. The CAF is only required to be installed in the BSC facility. To implement the decision to delete the FIM interface to the CAF requirement, the last sentence of para 4.1.3.4 ("The Forward Interface also includes the Commander's Agility Function (CAF).") & the next to the last sentence of para 4.1.3.5 ("In addition to the full capability, the CAF will provide visual output to selected members of the TA in the field.") are also deleted.</p> |

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| 68. | 41 | 5.7.1.3 | 4 | <p>NSC (Frank Moon): First sentence, as reads "both the SCS" to read "both the B/B SCS".</p> <p>Rationale: Do we really want the full-up corps/division capability to meet this requirement?</p> | <p>Partially incorporated. Replaced the entire paragraph with the following: "WARSIM 2000 must be transportable in support of the following specific use cases: the BCTP Brigade Command and Battle Staff Training (BCBST) Program, the five (5) RC BPC Training Program sites, and two (2) sets capable of supporting the training of brigade/battalion units being deployed to locations where access to a permanently stationed WARSIM 2000 system site is not available. For these cases, the SCS and the accompanying FIMs must be modular and scalable to the degree that within two (2) days, a complete system can be broken down and placed in packing cases that can be handled by two-person teams for delivery to, and subsequently set up in, temporary facilities that meet WARSIM 2000 facility requirements. The equipment must be capable of being packaged for transportation using commercial air, ground, or sea assets. Packing cases must be delivered with the WARSIM 2000 system for each of the use cases identified above."</p> |
| 69. | 44 | 6.3 | 1-4 | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete: "Comparable-sized B/B BSC SCSs ... for their students.". Add: "A self-sufficient, stand-alone B/B BSC version of the SCSs located at the RTCs are required for school training sites where WARSIM 2000 will be used to train units assigned to the school installations and for exercises and seminars conducted by the school.".</p> <p>Rationale: Clarity, accuracy.</p> | <p>Partially incorporated. Replaced in sentence 1 (& in para 6.4) the words "comparable-sized" with the words "appropriately-sized". To specifically state the requirement to be "self sufficient stand alone" for each use case precludes the contractor from development of the most efficient design.</p> |

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| 70. | 45 | 7.1 | 3 | <p>NSC (Frank Moon): Second sentence, as reads "BICM" to read "TACSIM".</p> <p>Rationale: WIM Program Office does not have charter to replace BICM; it does, however, have charter to replace TACSIM.</p> | Incorporated by rewritten paragraph. |
| 71. | 45 | 7.1 | 6 | <p>NSC (Frank Moon): Third sentence, delete "limited WIM functionality".</p> <p>Rationale: A limited WIM functionality will not meet INTEL user requirements. Nothing short of the full IOC as defined in the WIM SRD is satisfactory.</p> | Incorporated by rewritten paragraph. |
| 72. | 45 | 7.3 | 7 | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Delete: "stand-alone". Add: "stand-alone".</p> <p>Rationale: Accuracy.</p> | Incorporated by rewritten paragraph. |
| 73. | 49 | Acronym | 31 | <p>Fort Monroe, WARFIGHTER XXI Directorate (Phyllis Malcolm): Change "DOD" to "DoD".</p> <p>Rationale: None specified.</p> | Incorporated. Also checked to ensure it appears as "DoD" throughout the document. |
| 74. | | Thruout | | <p>Fort Monroe, WARFIGHTER XXI Directorate (Phyllis Malcolm): Using "i.e., and e.g.," need to have consistent with phases enclosed in parentheses or commas but not combinations as shown in ORD.</p> <p>Rationale: None specified.</p> | Incorporated. Appropriate changes made to paragraphs 4.1.1.3.6.1, 4.1.1.4.3.2, 4.1.2.1, 4.1.2.2, 4.1.2.3, 4.1.2.3.1, 4.1.2.3.5.2, & 5.6. |
| 75. | | Glossary | | <p>Fort Rucker , Gunnery & Aviation Systems Division (Dr. Elizabeth Plumb): Include the following:</p> <p>ASE - Aircraft Survivability Equipment.</p> <p>AMPS - Aviation Mission Planning Station.</p> <p>ARAT - Army Reprogramming Analysis Team.</p> <p>Rationale: Completeness.</p> | Not incorporated. Terms do not appear in the ORD. |

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| 76. | Annex A | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Add: "CJCSM 3500.04A, Universal Task List, 13 Sep 96".</p> <p>Rationale: Completeness.</p> | Not incorporated. Document is not pertinent to WARSIM. |
| 77. | Annex A | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Add: "DA Pam 11-xx. Army Universal Task List, 14 Mar 97".</p> <p>Rationale: Completeness.</p> | Not incorporated. Document is an unapproved draft. |
| 78. | Annex A | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Add "AMPS - Aviation Mission Planning System".</p> <p>Rationale: WARSIM 2000 should be interoperable with AMPS in institutional training at the Aviation Center. USAAVNC trainers in the Aviation Warfighting Simulation Center consider the use of AMPS in mission rehearsal and mission planning critical in training with simulations.</p> | Not incorporated. There is no Annex A. |
| 79. | Annex A | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Add: "Aviation Combined Arms Tactical Trainer/Aviation Reconfigurable Manned Simulator".</p> <p>Rationale: The AVCATT/ARMS, part of the CATT family, should be interoperable with WARSIM.</p> | Not incorporated. There is no Annex A. |
| 80. | Annex A | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Add: "CASEVAC - Casualty Evacuation".</p> <p>Rationale: USASAM distinguishes between casualty and medical evacuation, and WARSIM should reflect the distinction. POC is Mr. Moran, USASAM, DSN 558-7445.</p> | Not incorporated. This is covered in the change with Item 17. |

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| 81. | Annex A | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Add "MEDEVAC - Medical Evacuation".</p> <p>Rationale: USASAM distinguishes between casualty and medical evacuation, and WARSIM should reflect the distinction. POC is Mr. Moran, USASAM, DSN 558-7445.</p> | Not incorporated. This is covered in the change with Item 17. |
| 82. | Annex A | <p>Fort Rucker , Directorate of Training , Doctrine, & Simulations (Marilyn Rarick): Add "SATS TREDs - Standard Army Training System Training Exercise Development System".</p> <p>Rationale: Training audience needs to know of SATS TREDs in same context as SATS.</p> | Not incorporated. There is no Annex A. |
| 83. | App G to App 2 | <p>Fort Rucker , Gunnery & Aviation Systems Division (Dr. Elizabeth Plumb): Add: FM 1-114.</p> <p>Rationale: Completeness.</p> | Not incorporated. Cannot find citation in document. |

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Annex C (Training Strategy) to ORD for WARSIM 2000

28 August 96 (Version 2)

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Annex A (Rationale) to ORD for WARSIM 2000

Annex B (Coordination) to ORD for WARSIM 2000

Annex C Table of Contents

1. Battle Staff Training Events.

2. Battle Staff Tasks.

3. Users of WARSIM 2000.

4. WARSIM 2000 Training Concept.

5. WARSIM 2000 Training Support.

1. Battle Staff Training Events.

a. The Army's Combined Arms Training Strategy (CATS) describes training events to help commanders at all levels train their personnel. CATS describes the frequency of specific events, by echelon, required to maintain warfighting proficiency.

b. Events described in CATS that support commanders and battle staffs include Map Exercises (MAPEXs), Cell/Staff Section Training, Staff Exercises (STAFFEXs), Force Projection Logistics Exercises (FPLX), Command Post Exercises (CPXs), Command Field Exercises (CFXs), War Fighting Exercises (WFXs), Joint Training Exercises (JTXs) and Combined Training Exercises (CTXs). CATS also describes Training Aids, Devices, Simulators and Simulations (TADSS) that support each training event. As part of the strategy, computer-based battle simulations are recommended for enhancing the realism of these training events in order to yield quality training. Conceptually, by providing the battlefield environment, simulations provide the conditions under which a commander trains his unit to standard on specified tasks. Table I shows how WARSIM 2000 supports CATS-described training events.

Table I. Annual command post training events

| EVENTS | CELL | STAFFEX | CPX | | EXEVAL/ WFX/JTX | |
|-----------------------|---------|-----------|---------|-------|-----------------|-----|
| | | | CTC | CTX | | |
| LEVELS | SEC | TNG | Seminar | CPX | | |
| <u>BN</u> | | | | | | |
| AC | WEEKLY | 4 STAFFEX | 2 | 4 | 1 | N/A |
| | 4 MAPEX | | | | | |
| RC | 4 | 1 STAFFEX | 1 | 1 | EVERY | N/A |
| | 1 MAPEX | | | 4 YRS | | |
| <u>BRIGADE</u> | | | | | | |
| AC | WEEKLY | 12 | 1 | 4 | 1 | 1 |

RC 4 2 1 1 EVERY EVERY
4 YRS 2 YRS

DIVISION

AC WEEKLY 12 1 3 N/A 1

RC 4 2 1 1 N/A EVERY
2 YRS

CORPS

AC WEEKLY 12 1 2 N/A 1

RC 4 2 1 1 N/A EVERY
2 YRS

CRITICAL

STAFFEX CPX/ CPX

GATES

FTX

TADSS

WARSIM WARSIM WARSIM

c. Command Post Exercises are envisioned to have two separate but related parts: a seminar in an administrative environment, and a longer field portion using organizational equipment. WARSIM 2000 will support both segments even though they occur at separate times and locations. The key is that the commander is intimately involved to ensure that the battle staff understands his requirements for effective command and its own requirements for effective control.

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2. **Battle Staff Tasks.** CATS describes events to support commander and battle staff training. Other doctrinal publications such as FM 25-101, Battle Focused Training, MTP 71-3, Mission Training Plan for the Heavy Brigade Command Group and Staff, or MTP 100-15, Mission Training Plan for the Corps Command Group and Staff describe battle staffs tasks (along with the associated conditions and standards). These publications also provide guidance as to what tasks can be trained during which events.

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3. **Users of WARSIM 2000.** CATS describes different strategies for training the Active and Reserve components and the school populations based on their unique requirements and restrictions.

a. **Active Components.** Commanders from battalion through the theater commands will use WARSIM 2000 to provide realistic conditions for their battle staff training events. CINCs will use WARSIM 2000, in conjunction with the other services' theater-level simulations to conduct Joint Training Exercises/ Combined Training Exercises (JTXs/CTXs). Combat Training Centers will use WARSIM 2000 to expand their training environment by using it to portray front, flank, and rear activities during rotations. Commanders will use WARSIM 2000 in the conduct of Battle Command Training Program (BCTP) War Fighter Exercises (WFXs).

b. **Reserve Components.** Commanders from battalion through division and non-divisional combat and combat support brigades/groups and regiments will use WARSIM 2000 to provide realistic conditions for their battle staff training events. Commanders will also use WARSIM 2000 in the conduct of BCTP WFXs.

c. Due to the nature of future training events, WARSIM 2000 may support training involving users from other services and countries.

d. **Institutional Use.** Branch schools will use WARSIM 2000 to conduct command post exercises for students at officer basic and advanced courses, and non-commissioned officer advanced

courses. These exercises will reinforce the students' training on the skills required to fight combined arms battles at company, battalion and brigade levels as well as focus on branch specific skills. The Battle Staff NCO course, Combined Arms and Services Staff School (CAS3) and the Command and General Staff Officers' Course (CGSOC) will use WARSIM 2000 to support command post exercises that reinforce the commander and battle staff skills required to plan, coordinate and execute combat operations at the brigade and higher levels. Schools will be able to link their training to exercises being conducted by field units or other schools. As an example, students at the Battle Staff NCO course or CAS3 could represent a fourth battalion in a brigade or an additional brigade in a division level exercise. Students at CGSOC could participate in division or corps-level exercises, or even participate in Army War College or CINC-sponsored Joint Training Exercises.

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4. WARSIM 2000 Training Concept. Commanders of active and reserve component units want to train their battle staffs as they expect them to operate in war. Quality training requires realistic conditions. Short of actual combat, the most realistic setting is full-up, unconstrained, large-scale, force-on-force maneuvers. Fiscal and environmental constraints make these types of maneuvers infeasible on a routine basis for higher-level commanders. While using large numbers of simulators may be acceptable for battalion and below force-on-force training and may alleviate some environmental constraints, the cost of this approach for brigades, divisions and corps is prohibitive. An approach towards realistic training that is suitable to commanders, as well as being feasible and acceptable, is training in the WARSIM 2000 environment.

a. WARSIM 2000 will provide commanders a training environment that consists of a realistic simulated battlefield, realistic command post conditions and usable training feedback. To accomplish their missions on the WARSIM 2000 battlefield, the training units will have to synchronize their operations via comprehensive and detailed orders and instructions to their subordinates (and the simulation). In return, the simulation will provide them equally detailed and comprehensive results that are believable, although not necessarily 100 percent accurate, given the "Fog of War". Commanders across the Army will be able use this battlefield to train their units on a variety of contingency scenarios facing a variety of anticipated threats. The WARSIM 2000 system will provide commanders realistic conditions by allowing them to perform their wartime tasks in a wartime setting. During simulation-supported training exercises, command posts will operate from field locations (or on the move), using their organizational command, control and communications equipment. As the simulation system supports the execution of training, it will also provide useful feedback to support the evaluation and assessment actions that accompanies all training.

b. Training Feedback. The commander's ability to conduct AARs will be supported by the simulation system through the ability to rapidly extract information in response to specific questions that will assist in establishing what happened during the battle or campaign, and why those events happened. The simulation system will also produce standardized briefing products. The intent is to support the AAR process by answering the questions of "What happened?", and "Why did it happen", as a lead-in to the AAR discussion of how to do things better. WARSIM 2000 will support long-term evaluation efforts by providing the means of producing "take-home" packets for units and gathering information in a useful format for other training, analysis, test and evaluation and combat development needs.

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5. WARSIM 2000 Training Support. The Army will operate a distributed network of simulation centers that will contain the necessary computer hardware, software and communications equipment required to operate WARSIM 2000. Each simulation center of this network will have the capability of supporting a corps-level exercise. Multi-corps exercises will require the linking of these centers. Each site will have a

combined military and contractor simulation support staff. This staff will provide Exercise Planning and Execution Assistance, Opposing/Surrounding Forces, After Action Review Capability, and Simulation Control. The Fort Leavenworth facility of this network will have a more robust capability.

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